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UNITED STATES DEFENSE STAMPS

JULY, 1942

Industrial FINISHING

Published ... in the interest of Modern Production Finishing

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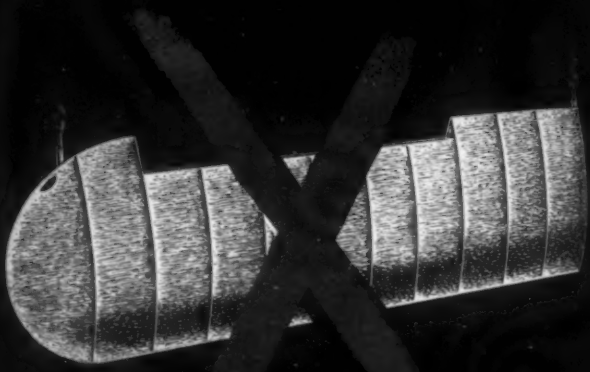
Our flag is a symbol of the United States which everyone understands. It has rallied Americans from Valley Forge to Bataan and it will ever inspire determined men and women to keep it flying in freedom. We of the Lilly Varnish Company are proud to participate in the national crusade to display the Stars and Stripes on the front cover of every magazine during this month of July, the anniversary month of our independence.

LILLY VARNISH COMPANY
Indianapolis, Indiana
THE LILLY COMPANY, High Point, North Carolina



STOP REJECTS

. . . due to BLUSHING!

IT is obvious that no production line can run faster than its finishing department. Therefore, delays due to the improper functioning of fabric dopes under adverse atmospheric conditions waste precious hours that America cannot afford to lose.

Emycel, a new development in finishes for fabric aircraft parts, has positive resistance to blushing in hot, humid summer weather without slowing down drying performance or affecting tautening properties.

Besides avoiding production slow-downs due to blushing, Emycel saves time in other ways — offers important service advantages and costs no more than conventional fabric finishes.

ROXALIN FLEXIBLE FINISHES
INCORPORATED
ELIZABETH, NEW JERSEY • Box 172

A TIME SAVING FABRIC FINISH

1 Engineered to prevent blushing under adverse atmospheric conditions.

2 Four coats do the work of six or more

3 No thinner required — viscosity controlled at point of manufacture.

4 Gives protection against mildew

5 Burns at 1/3 the rate of conventional fabric dopes.

6 Approved by the C. A. A.

To end preventable delays and simplify finishing of aircraft fabric parts, write for full giving particulars.

ROXALIN *Flexible* FINISHES

"WHERE THE FINISH COUNTS USE ROXALIN"

At Sea . .

Paasche GUNS BEHIND THE GUNS

Are Primed To Smash Your Toughest Finishing Problem

On Land . .

tanks and planes and guns
aasche painted products for
r are delivering Uncle Sam's
sign for Victory. The proof
Paasche jobs perfectly done
e found on the battlefields
the world.

There is a Paasche airpainting unit for every finishing job to be done and for every production requirement . . . for painting and coating shells, bombs, steel shell cases, grenades, fuse and booster parts, land mines and hundreds of other products. Put Paasche equipment to work for you and your finishing problems end.

Every unit is precision built to rigid engineering standards. They produce work that sails through the toughest Ordnance inspection. Exclusive features speed production, save valuable time. Paasche engineers—thoroughly experienced in all war time finishing requirements—are at your service without obligation. . . . Find out how Paasche automatic units and special equipment can speed your work. Send today for bulletin Fe-42 giving detailed information and specifications.

Paasche Airbrush Co.

1917 DIVERSEY PARKWAY
CHICAGO, ILLINOIS

Finish for Steel Shell Cases must be right

When the U. S. decided to make shell cases of steel to conserve brass, a new Zapon finish overcame the problem of preventing corrosion of the inside walls of the cases. Working with the Army from the inception of the project, Zapon perfected a straight phenol formaldehyde coating — S198C — that successfully met all special requirements. No substitutes in this job—too much at stake! Anything less than the best, any skimping might mean failure on the battle field. Corrosion or other effects on the shell case lining must be prevented by the right finish. There must be no compromise with quality specifications on such an important job.

Makers of shell cases, too, must insist that the finish they use meets these specifications. There must be no duds in finishing.

ZAPON

ZAPON DIVISION · ATLAS POWDER COMPANY

Eastern Sales: Stamford, Conn. Western Sales: North Chicago, Ill.

INDUSTRIAL FINISHES

EIGHTEENTH YEAR OF PUBLICATION

Industrial FINISHING

Reg. U. S. Pat. Office

Published Monthly in the Interest of Modern Production Finishing

Vol. XVIII, No. 9 JULY, 1942 $2.00 a Year

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Owned and Published by

Practical Publications, Inc., 1142 North Meridian Street, Indianapolis, Ind.

Eastern Representative: C. A. Larson, 254 West 31st Street, New York City; Phone Penna. 6-9049

Letters from Readers...

OF INDUSTRIAL FINISHING

These letters (and many others) were answered recently by the editorial department, but are published here to reveal certain interesting trends of desire and activity in the industry, and to encourage additional inquiries, comments and suggestions. Further information about any of them can be obtained by writing this office.—Editor.

Lacquers, Enamels for Glass

Kindly advise us the names of those manufacturers who specialize in making lacquers or enamels for spraying on flat and molded glass. We refer mainly to the coatings used on cast glass.—S. L. Co. (Certified Lighting Fixtures).

For Wiping Filler

In the past we have been using used burlap for wiping filler on our wood chairs. We can no longer obtain used burlap and would like to know if you have any suggestions as to a possible substitute. We would like to know what other chair manufacturers are using to wipe their filler.—Y. Chair Co.

One of our local furniture manufacturers advises us that they have switched from burlap to jute tow for wiping filler, and that they like it very much. It has less tendency to pull out filler from the wood pores.—Ed.

Conveyorized Drying of Furniture

We understand that you ran an article some months ago, written by Mr. E. S. Davidson of the Palmer-Bee Co. of Detroit, describing a conveyorized furniture drying installation at the Heywood - Wakefield Co., Gardner, Mass.

If you still have tear sheets available covering this article, we would greatly appreciate your sending us a set. If you do not have these please forward us a copy of the issue in which this article appeared, and bill us accordingly. — Heating & Ventilating Magazine.

We have published several articles on the subject mentioned but not, we believe, on the Heywood-Wakefield plant.—Ed.

Graining Brush Blocks

We are interested in obtaining information as to the proper procedure to follow in finishing various blocks and hair-brush handles in a fine grained finish and if you could give us any information relative to this process we would appreciate same.

You might also be in a position to give us the names of manufacturers who could furnish us with graining brushes.—L. Co.

Can Supply "Liquid Metallics"

We noticed in your June issue, that you have received inquiries on liquid metallics, which can be applied to wood or metal. We are sending you two samples of liquid metallics on wood, which we would appreciate your forwarding to the W. S. and C. C. Co., whose inquiries are published on pages 8 and 86. Please advise them that application can be made on wood, metal, plastic, composition, etc.

For their further information, we can

VINDOLAC

Still Available to Our Regular Trade, Also

DU BAR BLEACH WATEROIL STAINS
FILLERS . . . No. 1900 CLEANUP POLISH

and numerous other items

Although most of our facilities are now directed toward manufacturing Government products, we are still making every effort to supply regular customer requirements.

V. J. DOLAN & COMPANY, INC.
Mfrs. of "Unquestionable Quality" Industrial Finishes
1830 N. LARAMIE AVENUE CHICAGO, ILLINOIS

Conservation Improves Finish on Furniture

—ONE COAT—
PERFECTION SYNTHETIC **VARNISH**
LOOKS LIKE TWO COATS LACQUER

SURE! You can pack next day!
NO! It won't PRINT.
YES! It will DULL RUB or take HIGH POLISH.
NO! "Positively No" BLUE HAZE After Rubbing.

WATER PROOF • LIQUOR PROOF • MAR PROOF • ECONOMICAL
DURABLE AND OBTAINABLE

Available in a Full Range of Sheens

PERFECTION PAINT & COLOR COMPANY
INDIANAPOLIS, INDIANA

PASSED AND APPROVED!

Our Rust Inhibiting Primer No. 23696 and Lustreless Olive Drab No. 23680

Have been approved for U. S. Government specification finishes after undergoing rigid and exhaustive tests.

Can be brushed or sprayed, air dried or baked and will fit into any production schedule.

Manufacturers of equipment, with specifications that require these protective coatings, are invited to write us for liberal working samples, prices and delivery dates.

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METALIZED FINISHES
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Keep Your AIR LINES Clean with SPRACO

OIL AND WATER EXTRACTORS

Dirty compressed air with a high percentage of moisture and oil is very effectively cleaned by passing it through a Spraco Condensing Type Oil and Water Extractor. A cooling coil lowers the temperature and condenses the moisture and oil vapor on a series of baffles in the air stream. The accumulated oil and water is discharged through an automatic drain valve. Made in 2 sizes of 40 and 100 cubic feet for working pressures up to 125 pounds.

Write for "CONDENSING TYPE OIL AND WATER EXTRACTOR BULLETIN"

SPRAY ENGINEERING CO.
107 CENTRAL ST. SOMERVILLE, MASS.

match any color; the samples submitted here are merely representative of the type of results we are obtaining with our individual product . . . Liquid metallics contains no metal, therefore is not covered by priorities, nor is the supply in any way limited.—Allied Finishing Specialties Co.

Can Supply Lighting Fixtures

In your June issue we notice an inquiry from "AE" as to a source of supply for lighting fixtures. Will you please forward our name to this individual, advising him that we have been manufacturers of lighting fixtures for almost 25 years and also have a complete line of industrial, commercial and residential fluorescent units.—Lincoln Mfg. Co.

Abrasive Blast Cleaning

In the June issue, on pages 4 and 7, M. B. (Finishing Engineer) asks for complete information on finishing all metals for a contemplated handbook. If you will refer him to us, we shall be pleased to send him as much information as we have on abrasive blast cleaning of metal surfaces.—American Foundry Equipment Co., Mishawaka, Ind.

Bronze Powders Available Until Dec. 15

We noticed that on page 86 of your June issue the N. Mfg. Co. (Drapery Hardware) wishes to obtain a match to some sprayed bronze powders. Will you please inform this concern that we can help them out, as under revised Metals Order M-9-c-3, the use of bronze powders is permitted until December 15, 1942.

We have a fairly large stock on hand and should any further requests come in, please refer them to us, and we will do the best we can under the circumstances.—O. A. Both Corp.

Filler for Seams

Will you please send us the name of the manufacturer of the filler for seams and cracks in sheet metal products, as described on page 53 of the April issue of INDUSTRIAL FINISHING.—B. Co.

In the April issue, on page 53, we find an article describing the use of a pyroxylin putty for filling seams and cracks on sheet-metal products. We are very much interested in such a filler if it is durable and will with-

IT IS NOT TOO EARLY

to be giving thought to changing and improving the finish on new holiday items with a spray coat of beautifully colored

COTTON WOOL OR RAYON FLOCKS

Eye appeal and a velvety touch are important contributions to easier selling of items thus coated. The small increase in cost is easily more than recovered through the immediate interest of buyers who want "novelty" to sell. Many Patriotic novelties can be enhanced in beauty with RED, WHITE AND BLUE.

Write to Headquarters for Samples and Color Cards.

CLAREMONT WASTE MFG. CO.

CLAREMONT, N. H.

The country's leading flock mfrs.

194-?

Some year the war will end. Swords will be beaten into plowshares, and golf clubs and refrigerators.

There will be a swing back into the things we buy because we like them and not because they are a grim necessity.

You are planning these things now, or should be. Let us plan with you toward the finish for 194?, whenever it is.

We welcome any call for co-operation on long-range planning for the finish of the future.

Meantime, for 1942 and as far as we can see, we shall do our utmost to supply our customers with the best available materials and service permitted by wartime conditions.

The Varnish Products Company

5208 HARVARD AVENUE

CLEVELAND, OHIO

stand a baking of at least one hour at 300° F. Will you, therefore, please let us know who manufactures such a filler, so that we can get in touch with them and get quotations and samples? —W. Mfg. Co.

Composition Carvings

On April 11, 1931 we received a letter from one of your writers giving information for making composition carvings of the type used to decorate furniture.

We have never had to use this information until right now and find from trying that we have the formula but need some more information on the method of handling the material. For instance, what is the best or proper method of removing the carving from the die?

Is it removed immediately or is the die and carving passed through a drying oven and then removed. We have been unable to get experimental carvings from the dies. We made our dies from carvings we have had on hand, made by others.

We would like to correspond with some one who could give us information if we get stuck. It may be a good idea to make a short statement in your good journal INDUSTRIAL FINISHING. It may put us in touch with people who will give us the latest information on this work.—C. Cabt. Co.

Unfortunately we do not have the information you ask for. It occurs to us that you could buy these carvings for less than it would cost you to make them.—ED.

Appreciation

Many thanks for your letter of June 24, regarding another source of supply on ..... This is just another indication of the wonderful service you give your subscribers, and I take this opportunity to let you know your magazine is indispensable to any concern that may have problems in industrial finishing.—J. C. Co.

Repair of Table Top

I would appreciate some information concerning the repair of a table top that has several deep scratches. I was wondering whether some paste material could be used to fill the scratches. —Josephine D.

Probably the best way to repair your table top is to use stick shellac or stick lacquer, which must be heated and applied with what is called a

(Continued on page 75)

GKS OVENS

Electric, Gas, Oil or Steam heated . . . standard sizes or custom built to your specific requirements.

From the small cabinet type size to the large truck type size, there's a size and type GKS Oven available to meet practically any production requirement. All pre-assembled and tested at factory, and shipped completely equipped with necessary controls and safety equipment. Ready to operate when connected to source of power. Low cost, too, through modern Production methods.

For complete information phone, wire or write

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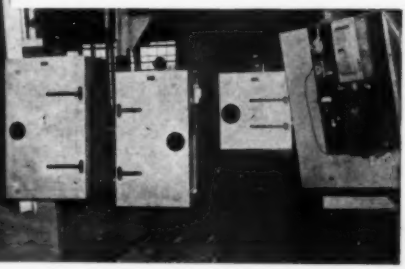


Finishing Government

BY H. W. CHESTER
Foreman Finisher

WHEN THE superintendent of our plant came in and asked me if I thought that we could finish typewriter desks 32-in. in depth on our conveyor line, I told him that I wasn't sure that we could. Frankly I didn't think it possible to finish desks 32-in. in depth on a conveyor system designed and built to carry bedroom and dining room furniture which is only 22-in. in depth.

We did some investigating and planning. After measuring and making some adjustments in the depth of our trays, width of openings in ovens, and several other adjustments to our conveyor, we started finishing these Government desks. We now have made several thousand of the desks and are still in production on them. Our production on these desks today is 40% more than it was when we first went into action on them, so I guess, "Where there is a will there is a way."

Our finishing methods and schedules on the desks are as follows:

Inspection; Water Stain Sap Stain; Washcoat

First the desks in the white are carefully inspected when they leave the cabinet department. All defective desks are set aside and carefully repaired and put in first-class condition before they enter the finishing room. All hardwood parts, such as posts, rims, etc., are stained by hand, using a brush and water stain. The desks are then loaded onto the conveyor to travel to the sap stain spray booth. Again they are carefully inspected by an inspector who removes any defective desk from the line and sends it back to the repair department.

At the sap stain booth all sap streaks in the veneers are carefully stained with a small spray gun, using a water stain for this purpose. Leaving the sap stain spray booth, the desks travel through forced heat to dry this stain. Then they enter the stain washcoat booth where they are stained and washcoated—using a water stain powder to color this washcoat.

After leaving the washcoat booth the desks enter an oven where they travel through the proper heat and humidity to force dry the washcoat. As they come from this oven they are allowed to cool; then follows the washcoat sanding with No. 6/0 silicon carbide sandpaper.

Sprayed Filler; Brushing; Force Drying

The desks enter the filler booth where they are sprayed first with a high-grade synthetic filler. A workman then brushes all over the case, using a 7-in. brush. This is done to remove all air pockets and it gives us a very good filling job. The filler, which is made especially for forced drying, is then hand padded, the workman using a piece of burlap that just fits his hand. The filler is rubbed off, wiping across the grain.

Then follows the final clean-up, using soft cheesecloth, pick brush and air duster gun. Workmen clean

Desks on the Conveyor

"This isn't our conveyor but it is very much like ours—same make, same type, etc."

all filler from the cracks and crevices as the desks pass their work station. The desks then enter the filler oven where they are allowed the proper drying time — with a heat of 160° F. and a relative humidity of 35%. After leaving the filler oven, desks travel back and forth by conveyor for 30 minutes to allow the filler to cool.

Now the desks enter the drawer coat spray booth where all drawers are coated with a good grade of flat lacquer. Then they enter the shading booth where all hardwood parts, etc., are uniformed with a high-grade lacquer shading stain. Desks then travel for five minutes to allow the shading coat to dry. Each desk is carefully dusted off with an air gun duster and soft cheesecloth to remove any dust before the sealer coat is applied.

At the sealer spray booth a heavy coat of high-grade lacquer sealer is sprayed on. Leaving this sealer booth, desks travel back and forth across the room by conveyor for 45-minutes to allow the sealer to dry. They pass by a circulating fan which blows cool air in the summer and hot air in winter to help in drying the sealer.

When the sealer coat is thoroughly dry it is carefully hand-sanded with No. 6/0 aluminum oxide sandpaper. Then follows the removal of all sealer dust caused by hand-sanding. For this operation we use a soft cheesecloth with just a little varnish on the cloth to make it tacky enough to pick up the dust. This is followed by a dusting off with an air duster gun.

The desks enter the varnish spray booths where a high-grade water-resistant and alcohol-proof synthetic flat varnish is applied, the workmen using a double coat for the tops. This varnish coating

is force-dried under a heat of 150° F. at a relative humidity of 35%, for 1½ hours. The drying all takes place in a conveyor oven. These ovens have automatic controls so that this heat and humidity can be constantly maintained.

Drawers Waxed; Tops Rubbed

After leaving the varnish ovens the desks are unloaded and all drawers are carefully sanded and waxed inside. The desks are allowed to dry for 22 hours, after which the tops are carefully rubbed with a portable air-operated rubbing machine fitted with felt pads. For this operation, we use 3F pumice stone and paraffine oil.

Following the machine rubbing, the tops are wiped off with soft cotton waste to remove all traces of oil and pumice. Front ends and backs of desks are steelwooled and waxed, using No. 3/0 steelwool and a good grade of nut brown paste wax. The excess wax is then removed with soft cheesecloth.

The top gets a final clean-up with a special cleaner to remove all oil residue. The desks are again carefully inspected and all pieces defective in finish, construction, etc., are culled out and sent back to the repair department. The desks are then wrapped in glazed paper, padded and packed in cartons.

Finishing Metal Register Grilles

IN THIS article I am presuming that the grilles (for floor and wall registers) are made of steel, using cold-rolled steel on the borders and hot rolled pickled bars.

Primarily the secret of a good finishing job is the cleaning operation, before any paint is applied. Of the many different ways in which this may be done the following two are suggested: You may load a rack full of grilles and run them into an oven at a temperature of 450° to 500° F. This heat will burn off all the grease and oil but will not remove the dirt and fine metal grindings which you will have left on the grilles after you buff or grind the welded corners.

The second way, and to my knowledge the best way, to clean the grilles is to have two large dip tanks approximately 3x5x6-ft. deep. Fill the first dip tank with a good commercial cleaning solution and heat this to the temperature recommended by the manufacturer. The grilles are actually boiled in this solution from 20 to 30 minutes to remove all grease and impurities.

After the grilles have been in this hot solution for the required length of time they are removed and rinsed in the second dip tank, which is filled with clean boiling water. Then they can be dipped into a tank of rust preventive solution, or allowed to air-dry. The surfaces should be painted as soon as possible before any rust can form.

The grilles are then primed with a walnut or light oak baking primer which is sprayed on. They are placed in an oven and baked for one hour at 400° F.; then they are removed and allowed to cool, after which they are grained.

Graining may be done by hand with a graining brush or sponge, but the use of rubber rolls, with the grain imprint etched on them, is the most economical method for graining. A commercial grade of ink is used for this purpose. The ink is allowed to air-dry for from two hours to over night, depending on the weather conditions, and also how soon the grilles are needed.

When the ink is dry, spray on one coat of clear baking varnish; this is then baked for one hour at 300° F. However, care must be taken to avoid spraying on too heavy a coat of varnish. Following this varnish baking operation, the grilles are removed from the oven and packed in cardboard paper cartons ready for shipment.—GARY MCLAIN.

Frolics in the Finishing Room—11

AS A general rule there are many pranks played in finishing rooms where men are working. Often it is just a case of breaking the monotony of the usual daily grind. The incident that I now have in mind happened in a factory where colored enamels were used in a large way in production.

The spraymen wore white coveralls and cleanliness was the order of the day, every day. At two spray booths located side by side, one operator was spraying black enamel. The other one was spraying bright red enamel. The operator using black happened to overspray his booth a little to the extent that he sprayed a small amount of black enamel onto the uniform of the other operator. This slip was immediately resented by the other operator who was a high strung fellow and very particular about keeping his uniform absolutely spotless at all times. This black spray on his clean uniform got him—and to get revenge on the other operator he shot back with his red enamel, giving the other fellow his just pay, so he thought.

Well, this only led to another shot of black, coming back a little stronger the second time—to show the red spray operator that "Black" was ready to give him as much black as he had red. This led on to several increasingly heavier shots back and forth until it got so bad that both operators just stood with their guns wide open pointed at each other.

Of all the messes I have ever seen, this beat everything. It was a sight. Both operators had a merry time at their party—in the battle of colors. But the cleaning up afterward was not a happy experience. Both of them had to use naphtha to wash their faces and arms. They had to remove their uniforms and have them washed in naphtha. The mess around the booths and floor had to be cleaned up. And to add to the cost of their expensive color fight, both of them were laid off for a week—to get back to normal.—F. W. WORTH.

Ideas Help Win the War

The "MacArthur Month" campaign, conducted by Bausch & Lomb, Rochester, N. Y., to stimulate the flow of ideas to save time, labor, and materials and improve manufacturing processes, produced 2,035 ideas in 30 working days. This was at the rate of about 68 per day as against approximately ten a day received under ordinary circumstances. The returns in the final week exceeded those for the full year of 1941.

Infra-Red Paint-Drying

PRODUCTION experience with materials, equipment and methods eventually determines their relative merits and importance in industry. Now, especially, production executives are eager to have manufacturing operations move along on schedule—smoothly, rapidly and, if possible, economically.

In this connection, the extensive use of near infra-red equipment for quickly drying paint coatings on pressed metal products is well illustrated in the plant of the Square D Co., manufacturers of electric motor starters and controllers, washers and distribution panels.

The Industrial Controller Division of this company, located at Milwaukee, Wis., specified the radiant energy method of baking protective coatings on pressed metal products when they moved into a new modern plant a year ago, because this process lent itself so admirably to other mass production methods used there.

As is indicated by the division name of the company, only industrial control parts are manufactured at Milwaukee; switches and panels are finished similarly at the Detroit, Mich., branch.

At the Milwaukee branch, 272 Fostoria para-sphere reflectors are built into a flexible tunnel, which permits a tunnel opening of 4-ft. between reflector edges for the largest pieces that pass through the baking zone, or a closer distance for smaller pieces.

On opposite page, top—General view of conveyor loop which passes through an adjustable infra-red drying tunnel.

Bottom—A close-up look into the drying tunnel which is adjustable for width. Both views taken in the Milwaukee plant.

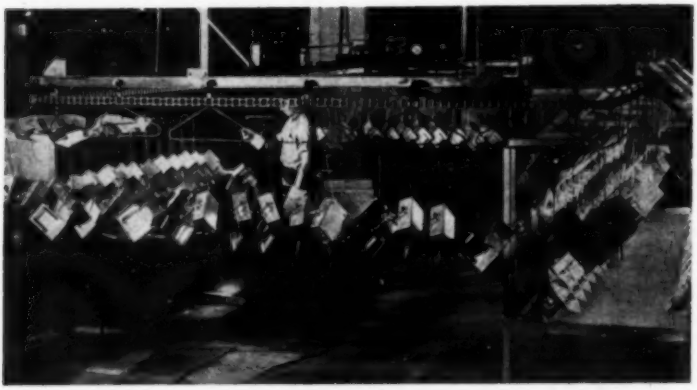
The parts get two coats of sprayed enamel, with a short stand-out time between each coat. They are then carried through the heating zone by an overhead variable-speed conveyor which can be adjusted to travel at any constant speed ranging between 1½ and 9-ft. per minute. Since pieces of various sizes and thicknesses pass through this tunnel, various conveyor speeds are necessary to allow a variety of baking times. These time factors vary from 3½ minutes on small parts to seven minutes on large parts.

Previous to the adoption of this process, the time required to bake the finish was much longer, sometimes necessitating as much as one hour to bake-finish a batch of parts, as compared to a few minutes at present. No more additional manpower is needed now than formerly. There is no loss of energy because there is no necessity for oven preheating, and the baking operation can stop or start instantly with the same beneficial results as if it had been in continuous operation.

The infra-red drying tunnel is so wired that various rows of reflectors can be operated independently. This permits a saving in operation costs because it is possible to send small parts through the tunnel in such a position that possibly only two rows of lamps need be in operation.

A delay in available material to be finished does not require continuous oven operation. A workman merely turns off the switches and no actual waste of energy occurs, yet the heat is ready to go on again at a "seconds" notice.

At the Detroit branch, switch boxes are dipped in either black



The dip-finishing station, conveyor loop and drying tunnel in Square D's Detroit plant.

or aluminum finish. The dipped boxes are allowed to drip momentarily and are then hung on the conveyor hooks to travel through the 15-ft. tunnel.

It is estimated that one man can paint and pack approximately 225 boxes per hour with aluminum finish—affording a baking time cycle of six minutes. Or the same man can paint and pack 450 boxes per hour with the black finish—with a time factor of 4½ minutes.

From start to finish the process affords Square D speed, economy, cleanliness and flexibility of operation, and is highly praised by company workers and executives.

Durability; Smoothness; What It Takes

THE problem of presenting a product and having it meet with approval, public or military as the case may be, is often cause for some anxiety. While there are many factors to be taken into consideration, that of appearance is of vital interest in solving this problem. The reception accorded any product is the warmer, the better its appearance.

The best product, with a shabby paint job, will not sell to expectations despite expert advertising—nor will the best paint help matters much. Good appearance demands thorough, exacting preparation.

Among the many operations involved in preparing a unit for the spray booth, that of cleaning or wiping the piece is of present concern. The elimination of dust and dirt particles is readily effected by the use of tacking cloths or tack rags.

There are several fine grades of tack rags on the market. Many firms also make their own, finding them quite satisfactory. Easy to use, these specially prepared rags spell the difference between an ordinary finish and a superior one. Their cost is negligible, their benefits surprising.

In view of the added requirements demanded of all finishing today, "tacking" takes on added sig-

[*To page 21*]

A Spectacular Advancement IN AIRCRAFT PAINTING

made possible with the

This gigantic, 3-level ventilating equipment—a multiple assembly of Mahon Hydro-Filter Units, combined with a mammoth Mahon Filtered Air Supply System—performs a double function. It clears the room, at three separate levels, of dangerous overspray and fumes and continuously floods the entire space with washed and filtered air, maintaining an equalized air flow throughout the room. Enclosure is 150' wide, 100' long, 35' high, the largest spray booth and ventilating system ever designed and installed, so far as is known.

SPRAY PAINTED *after* COMPLETE ASSEMBLY

One of the problems encountered by the aircraft industry in meeting the seemingly impossible demands of modern war production was the painting—*after complete assembly*—of an entire airplane. Such an undertaking necessitated not only a spray painting enclosure of immense proportions but a satisfactory means of exhausting the paint-laden air from the enclosure and replacing it with washed and filtered air to insure operator protection and adequate safety precautions against fire and explosion. The problem was put up to Mahon engineers for solution. They succeeded in solving it by designing the ventilating system, described and pictured above. It offers compelling evidence of the ability of the Mahon organization to participate in the working out of ANY spray painting project—big or little—in the aircraft industry—or elsewhere.

For the interesting details of this achievement, write

THE R. C. MAHON COMPANY
DETROIT • CHICAGO

Metal Cleaning Machines, Rust Proofing Machines, Hydro Filter Spray Booths, Ducts of All Types, Filtered Air Supply Units, Hydro-Filtered Dust Collectors and many Other Units of Special Production Equipment—including Complete Finishing Systems

MAHON

Flying Tanks

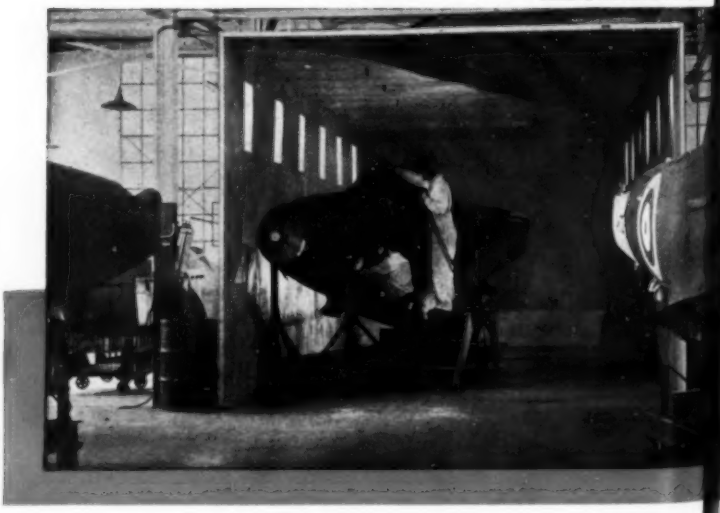
— that are quickly camouflaged with DeVilbiss Spray Systems

● Half pursuit plane—half aerial tank—that's the Airacobra. Built around a 37 mm. cannon, the Airacobra has the attacking power of a tank combined with the hurtling speed of four hundred miles per hour.

To speed the building of these cannon-on-wings, the manufacturer has adopted revolutionary methods of assembly line production.

For instance, each assembled Airacobra gets three coats of primer and camouflage paint, besides touch-up and insignia.

Photos by Bell Aircraft Corp.



These operations are performed in giant DeVilbiss Water Wash Spray Booths with modern DeVilbiss Spray-Painting Equipment.

It's the Airacobra's speed and power that make it an outstanding fighting weapon. And it's the speed and efficiency of DeVilbiss Spray Systems that have put them on first call for product finishing and plant maintenance in so many war industries.

If your war job is to produce any type of fighting equipment—bombers, tanks, guns, shells—or essential arms building equipment, there's a good chance that DeVilbiss can help you get the top speed America needs on all war output.

THE DEVILBISS COMPANY • TOLEDO, OHIO

Canadian Plant: WINDSOR, ONTARIO

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SPRAY SYSTEMS

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TO WIN THIS WAR, more and more billions are needed and needed fast—AT LEAST A BILLION DOLLARS A MONTH IN WAR BOND SALES ALONE!

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U. S. War Savings Bonds

This space is a contribution to America's all-out war program by

INDUSTRIAL FINISHING Magazine

nificance. Products for the armed forces—be they trucks, tanks, cabinets and hundreds of others—see constant usage, hard usage. In most instances the paint job is according to rigid specifications. Probably not stated, but assuredly included, is cleanliness.

A pertinent analogy to this matter of cleaning is found in arc-welding. Small holes, breaks in the flow of the weld, and evidences of imbedded slag in welds—all of these are weak spots for which the inspector is ever on the alert. These imperfections make for weak welds, they are the weak links in welded tanks and trailers and aircraft, as well as other heavy craft.

Likewise, dust and dirt particles between metal and paint make for weak spots in the finish. These particles, covered with paint, remain as tiny air pockets easily susceptible to punishment from sun, rain, wind and the extremes of temperature. Not long after they are met as rust spots. The Army and Navy want none of this, nor do you.

As for the public, its choice is becoming more restricted day by day. All the more reason that what is left should not become a leftover. With production of domestic commodities greatly curtailed, if not altogether stopped, the finishing department assumes greater importance and greater responsibility than ever before. The film of finish is a seal protecting a product. It is as well a bond of strength and permanency.

The paint manufacturer is definitely doing his best under present circumstances. Many materials to which he once had access are now closed to him because of their vital importance in their direct war effort. While he is working to perfect substitutes, he can be helped decidedly. Help him; help yourself; help us all. Keep that finish clean. —G. E. RENNER.

Making use of lighter wood to look like brass, this server is scaled to fit the small defense home. It is made of pin striped walnut and is part of a complete dinette suite priced to fit the war time budget. American Furniture Mart Photo.

Luminous in Blackout

Complete blackouts do not bring immunity from air attack, and every last bit of light cannot be extinguished. The next best thing is to use luminous material which would be invisible from above. Among such materials would be luminous paints on air raid warden badges and other official badges, window shades, cuffs of men's trousers, interior coating of rooms, stair treads, lamp posts, fire hydrants, etc. Such material glows for several hours after the original source of light is cut off. Luminous plastics can be used for cut-out letters or exit or danger signs.—S. G. HIBBEN.

Inspecting Aircraft in

I am an inspector in the dope room and fabric department of an airplane plant, and after reading your magazine the thought occurred to me that you might be interested in an article dealing with this phase of the work.

As an inspector one has to keep in mind production and quality at the same time, and his ability as an inspector is judged by the finished product, plus the degree of cooperation between the departmental inspector and production foreman.

I hope this article is fitted for your magazine. I chose the type of article written, rather than a technical treatment, because I believe that if inspectors understood the value of their positions better, they would do better work.

WEBSTER defines an inspector as "one who examines carefully and critically." However, this definition is sometimes deplorably distorted by production foremen and workers in various production departments when the schedule is tough and they are trying to keep up the volume of production as set up on the production charts.

When such distortions are made it proves Webster's definition more thoroughly, and for that matter more accurately by Production's repeated insistence that the inspection is too——careful and too——critical. In some cases the production department insists that the proper place for an inspector is some remote isolated place where nitwits are sure to be found in overwhelming abundance. To further substantiate and amplify their well punctuated assertions, they will remind you that hundreds of airplanes have been built and flown very successfully without the benefit of an inspector's judgment. Yet, it is quite amusing how quickly they will take refuge behind an inspector's stamp when, for some reason, a piece is used that does not fit or measure up to standard.

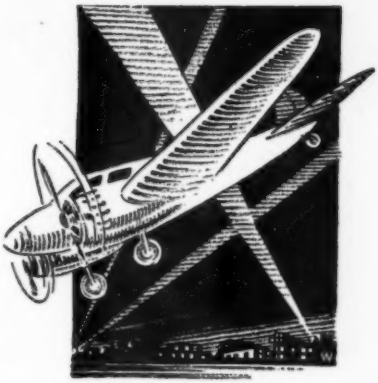
Objections to Strict Inspector

From the above paragraph it would seem that the inspector is a detestable nuisance—in fact a detriment in any department. To the extent which this feeling may exist depends a great deal upon the inspector himself. The most valuable asset any inspector can possess is the ability to examine a piece of work and if necessary reject it, yet retain the goodwill of the production foreman and his workmen.

Naturally, when the heat is on, when the worker is racing against time and doing a difficult job, he

Production

BY H. J. ETHERIDGE



will flare up when his work is rejected. Quite naturally his foreman will flare up at the inspector when for various reasons the work is held in the department for repairs or defects, especially when the next department is waiting for those very pieces to begin assembly. It's funny though how tempers relax when the shift is over; grudges are shifted aside as one sets aside the burdens of the day.

An inspector has no authority over a production worker, yet he can stop a piece of work at any time if it is not according to the standard set up by the engineering department. In most departments, any instructions the inspector cares to give the workers must be given through the foreman. In some departments foremen gladly let the inspector deal directly with the worker, because they realize that if a mistake is made the time to correct it is then, and not to wait until the piece is finished.

Tolerance; Firmness; Thoroughness

Speaking of the ability to retain and hold the goodwill of the production worker and his foreman, I wish to express my admiration for the chief inspector of the corporation where I am employed. Tolerance is blended with a firmness and thoroughness that brings about the ultimate goal of every factory engaged in *quality production* instead of *quantity production*. Every person likes to wear some sort of crown, so perhaps it will be forgiven the inspectors of a factory when they claim the credit for being the chief factors in sustaining the quality of the product their company places on the market.

At the present time I do not claim to be a "really good inspector." That will come only with more time and study, and a thorough and complete knowledge of all the factors contributing to the sum total of the conditions under which any given item is manufactured. However, I hope to rise to membership in that group in the not too distant future. Perhaps now is the time to analyze those conditions and characteristics of a "really good inspector."

First, I believe that the quality just mentioned should be placed at the top of the list. Only by a firmness of purpose and a strict adherence to the standard of quality, can a departmental inspector avoid becoming sloppy, and permit slipshod half-inspected work to filter through his department. He must develop pride in himself and in his product to such an extent that when he places his approval on any piece, it is a warranty that the piece is free of defects, is up

to specifications. Lacking that pride I believe one cannot become a "really good inspector."

I mentioned tolerance a few lines back. What do I mean by that? As an inspector, it becomes necessary to reject a piece of work oftentimes when it would be much easier to accept and stamp it. Tolerance is the ability to reject work without a personal sting, the ability to quietly take a cussing from the production worker or foreman without losing one's head or temper. Even while the worker is cussing you, he realizes you are right, that you understand that the reason for his flare-up is because he is doing his darndest and you won't hold it against him for easing off the pressure.

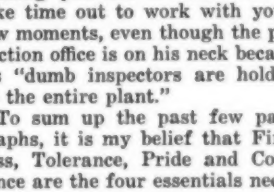
Confidence of Chief Inspector

These traits must either be natural or quickly acquired if one wishes to become a "really good inspector." The third and important essential depends entirely upon the Chief Inspector. What then, is that third essential? That is the confidence the Chief Inspector expresses in his subordinate when he places him in a department and says: "It's up to you. You can do the job, but if you get stuck don't be afraid to ask for help."

Breaking that statement down, I mean that a departmental inspector must be able to go to his boss when he gets stuck, without fear of having the boss say to himself, "Guess I'd better get another guy, this bird doesn't know all the answers so he might make a mistake."

It means you have a boss who is not breathing down the back of your neck, waiting for a chance to "hop on"; that if the inspector has any initiative he can exercise it without fear of getting put on the spot. It means that even though you do make a mistake, instead of "taking you for a ride" he will take time out to work with you a few moments, even though the production office is on his neck because his "dumb inspectors are holding up the entire plant."

To sum up the past few paragraphs, it is my belief that Firmness, Tolerance, Pride and Confidence are the four essentials necessary to become a "really good inspector." Of course, one must study his department and keep continually studying. When one reaches that point where he thinks he knows all the answers, a few errors occur that are painful reminders that one doesn't yet know it all. It is said that a "really good inspector" can only catch 90% of the errors. Mathematically, it is easy to figure what a fair inspector with a half-hearted interest in his work, will do.



Assuming that every inspector has the right qualifications, what are some of the problems a departmental inspector must face? What are some of the conditions under which he must function? What are some of the factors he must think of as the production tempo increases?

Our Inspection Calls for Trained Eye and Touch

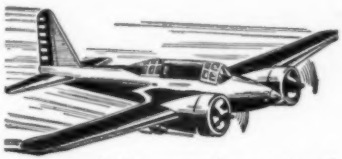
Perhaps, it would be wise to differentiate between a departmental inspector and one who works in the crib or at a desk. The last two

do their work in a set routine method and record their findings on a chart or some other form chosen by their company. For the purpose of this article I shall use a broad definition and define them as mechanical inspectors, for the simple reason that most of their work is done with gauges, rules, micrometers and testing machines, and most of the pieces that come in for this type of inspection are fabricated by machine. The pieces are then brought to the crib and checked according to predetermined charts. In no sense of the word, though, is this type of inspection less important than the other type, for it is exact accuracy that they are watching for in every piece.

On the other hand, in the departments I shall mention in the following paragraphs, the inspectors use very few if any tools. They must depend upon their eyes and sense of touch to determine if the work is up to standards set for it. Of course, there are definite set things that must be constantly checked and rechecked as the pieces move toward completion. Departmental inspection is made necessary because it is in the department that the large pieces are made and fitted together. It is here that dozens of the smaller pieces that have been inspected are brought together and the various assemblies begin. It is at this stage that most of the hand work is done. Here too, the skeletons of the different types of airplanes begin to take shape and move down the assembly line toward final assembly—and then they are taken up for test flight.

Wood Parts of Aircraft

It is in the woodworking department that the spars, ribs, framing and all other portions of the air-



plane made from wood are cut and joined. Only the practiced eye and touch of the inspector can determine the number of annual rings in the wood selected. No machine judges the straight line of the grain or absence of knots and distorted grain structure. No machine judges the density and quality of the wood and passes on the fitness of each piece as it is prepared to take its place in the wing structure, and help man soar in the sky like an eagle.

When cut and built into a wing, that same piece of wood, with many hundred other pieces passes to the wing inspector. Here too the eye and touch is the vital factor on which the pilot must depend when he flies the ship through the clouds. Of course, there are instruments to test the tightness of the cross braces and tensile strength of the bracing, but the eye must detect those gussets that are loose. The eye and touch must determine the smooth finish of the wood, see that all joints are securely glued, all lock pins and nuts are tight and the ribs straight with the line of flight. Only the practiced eye can tell if every inch of the clean white spruce is properly treated with a preservative and laps are true and accurate.

Fabric Department

When approved by the wing inspector, where does the wing go next? To the fabric department. Here it is covered with the fabric selected by the engineering department. Here the wing begins to take

the shape it must hold when it is seen on the flying field. What then are some of the important things the fabric inspector must watch?

Upon him falls the responsibility of seeing that the ribs are properly braced with the proper reinforcing tape, that no sharp edges are permitted to cut through the fabric, that the wing is properly covered and the fabric securely doped down true and tight. He must see that all knots are tied right and tight, all lacing cord and surface tape across the wing is tight and in line; that all openings for fittings are reinforced and drain grommets and inspection rings are tight and in the right location. Here too, the fabric is checked against mill defects and holes; broken threads and tears. These are just a few of the many things he must watch, and only the trained eye and a delicate sense of touch are the two tools that are used most.

Welded Tubing

Even the layman knows what welding is, but the average person would never dream what an important department this holds in the manufacture of a modern airplane. The right size tubing is carefully selected and cut to the proper lengths and sent to the welding department. There skilled workmen place the tube in jigs, and under the hot, burning tips of their torches countless shapes and forms are brought into creation. Then these various shapes are placed in a master jig and, like a mighty bird, the outline and shape of the fuselage and tail surface grow until the completed ship rolls on the line ready for the welding inspector. Upon him is placed the responsibility of seeing that those hundreds of welded joints will hold together when subjected to strain. He must guarantee that no tube is cracked or bent, that no joint will open or pull loose when the ship is buffeted by storms and wind. He too must think of the pilot and passengers' safety when the ship roars through fog and rain.

Space will not permit the enumeration of all the departments that play such a vital part in the creation of the modern airplane. Large or small, each department has its unique and exact responsibility in maintaining the safety and perfection of the modern plane. Each inspector has, as his goal and inspiration, the finished plane free of defects and completely "airworthy." It makes no difference if the inspector is working in the crib or in the department; he must realize that the safety and strength of the ship depends entirely upon him. It is said that a chain is only as strong as its weakest link. This is true of airplanes; no ship is stronger than the weakest point in its structure. The inspector must find that weakest spot.

What Is Done in Dope Room

As we follow the progress of the ship through the factory, it comes to the dope room. It is here that the completed assemblies are given their final treatment before final assembly. Here is where all the fabric surfaces are treated with prepared materials, so they can withstand the terrific pressure exerted by winds and storms when the ship goes aloft. Here the metal parts and entire ship are painted the various colors that please the eye when one visits an airport.

What responsibility must the dope-room inspector assume as the ship moves through his department? When the ship comes into the dope room the fabric surfaces

are soft, and will tear as easily as a shirt. It is here those same pieces of fabric are saturated and doped, and built up to withstand from 50 to 150-lbs. of pressure per square inch. By the time this operation is completed the fabric covering around the various forms is stretched to such tauntness that when thumped it sounds like a drum.

Through the successive operations necessary to obtain such perfection, only the eye and the touch are used to see that the proper results are obtained. The ship is given the required coatings of clear dope and thoroughly checked after each operation. After the clear dope is applied the silver dope is the next operation to be again checked over and all points tested before it is given the finishing color.

Through all of these operations, the inspector must see that all surface tape is tight, that no holes are cut in the fabric, no weak spots and air-pockets occur, and every part of the ship retains its true form. Here too every point is checked again that was checked by the fabric department, for upon the proper doping and tension of the fabric depends the safety of the pilot. Yes, truly man is creative when he takes the materials he does, builds them into a composite whole which he calls an airplane, and makes of it such a deadly instrument, or a boon to civilization.

Inspector's Responsibility

Awhile ago I spoke of the conditions under which an inspector must work. They vary with each department, yet some of the conditions are the same in every department. Daily, hourly an inspector must watch the work as it takes shape. He must see everything that happens, yet keep out of the way of production workers. It is up to him to see that all necessary corrections are made, yet not slow down production. He must keep up with production, yet the work must be correct, up to specifications as it moves from one department to another.

Whatever the working agreement between the inspector and department foreman, it is on the inspector's shoulders that the responsibility for the quality of the work is placed. Once a piece is stamped, the foreman has only to shrug his shoulders and say: "The Inspector passed it. The department is not to blame. If the defects had been pointed out I would have had my men correct them." But, its the pointing out of those defects wherein the battles and the fun begin.

Production Versus Quality

When a department is running full blast, when the errors are popping up fast and the inspector is calling them as they come, then the old battle of *Production* versus *Quality* really gets under way. Then the fun begins. The foreman is thinking in terms of time; workers are thinking in number of pieces they can get finished; and the inspector is thinking of how nearly perfect the piece should be. Who wins the battle? That is for someone else to decide. We have darn good airplanes, in fact the best, so it looks like the inspector won. We have lots of airplanes and more thousands are coming along so it looks like the production workers won. Yet, we have made those same airplanes in a damn short time so it looks like the department foreman won. Only "wone" thing I do know for sure: "I wish I was a really good inspector."

CLEANING, PAINTING AND REFINISHING

Streamline Trains

I am submitting a brief outline of how our Streamline equipment is finished. I have not gone into details on the various operations; however, this can be taken care of at another time.

The painting and decorating of locomotives, both freight and passenger equipment, involves many branches of the trade, such as making mirrors, screen process work, etching brass and metal signs, cutting metal stencils, art sandblast work on glass, etching and chipping glass, signs of all kinds, and graining and finishing of most any requirement.—THE AUTHOR.

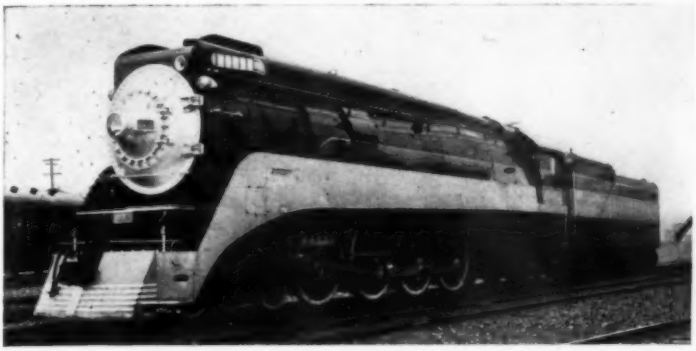
BY T. M. DAVIS

THE railroads are the arteries of this great nation. Through these arteries the life blood of the nation flows. Good food and supplies for our armed forces, as well as our civilian population, must flow constantly from all sections of this great nation. Our company, the Southern Pacific R. R., is one of the main arteries out here on the west coast, and from the heart of our country comes materials and supplies that will win this war. And the railroad's motto is: "Keep 'em rolling and everyone doing his part."

However, we must not overlook the fact that the protective coating materials used on all of this equipment must be one of the deciding factors in keeping these locomotives and cars free from rust and corrosion. We all know that metal is essential in this war. The finishes may be oil paints, varnish colors, lacquers or synthetics, but the thought in mind should be lasting beauty and protection.

For the proper protection of the metal, it should be thoroughly cleaned first. I suggest that it be sandblasted (blast cleaned) to remove all rust and scale. A proper primer must be applied that will adhere and dry firm. This is followed with a surfacer and glazing of a hard drying nature, which will rub to a smooth finish. The finishing coats, sprayed or brushed, will be smooth and glass-like. The surface will not only be one of lasting beauty, but it will be easy to keep clean.

The locomotive, painted black or colored with clean cut letters and



Locomotive and tender of Southern Pacific's "Daylight" streamliner. Two of these trains are in regular service on the dawn-to-dusk run between San Francisco and Los Angeles, Calif. The 471-mile distance is traveled in 9¾ hours, with only five stops enroute.

striping, gives a picture of outstanding strength as the train glides into the station. The finishing lines of the passenger cars, in their light pleasing pastel shades, have added greatly to the railroads' passenger travel. These beautiful cars help build the morale of our boys in the service—those who are moving in these trains. The colors are cheerful; one car is one color and the other car another color. A car may be painted in this scheme: Headline, flesh tint; side walls, peach glow; pier panel, coral; base, cinnamon brown. The colors are planned so that the furniture can be arranged to harmonize in each car.

The exteriors of these cars are finished up in flashy shades of orange, red, black and aluminum, making a beautiful appearance as this palace of wheels, 15 cars in length, glides through the country and along the coast line.

Cars Are "Shopped" Every 12 Months

The cars of the streamline trains are "shopped" every 12 months. When they arrive at the shop they are placed on a spot track. The track receives its name from the different operations in repairing and painting the equipment. The first spot is where the car is stripped of furniture, carpets, hardware, window shades, etc. The second spot is a wash track, where the exterior and interior of each car are thoroughly washed. The third spot is for the repairing of the interior and exterior, with overhauling trucks. The fourth spot is for painting and decorating. The last spot is the trimming of the car, replacing furniture, shades, etc.

All fittings, such as electrical switch plates, locks, hinges, etc., are removed and plated when necessary. Seats and window shades are removed and taken to the upholstering department where they are blown, cleaned and repaired. Tables, chairs and writing desks are refinished when necessary.

When painting the interior, certain parts of the moulding and corner pieces are taped with industrial tape for protection. A metal shield is then used by an experienced op-

erator, who, with an air gun, applies the various colors skillfully to keep bright metal moldings clean and free from paint. The colors on the outsides of these cars are also applied with the paint spray gun.

I have only mentioned our streamlined equipment. However, all of our steel equipment used for passenger service and troop movements is "shopped" and goes through the same procedure as the streamline trains.

Industrial Paints for War Production

IT IS common knowledge that a definite change has come over the industrial paint business. It had been taking place for some time, slowly for a while, but lately the rate has been rapid.

There is not much manufacturing of non-war goods, but the volume of production of war things is tremendous. Most of the paint used on these war products is limited in kind by specifications—usually formula or performance specifications. In other cases it seems to be limited to a particular item of a designated paint maker whose product has somehow come to the favorable attention of the war division that is ordering. In still other cases the contractor is restricted in his selection to brands named in a list of approved paints.

In the early days of the Defense Program, a number of firms submitted samples to the various government specifying offices, for such official approval and listing.

After Pearl Harbor, when the program turned from Defense to War, there was much to be done and there was an understandable insufficiency of time and facilities. Consequently a paint manufacturer was permitted to guarantee that his war paint met its respective specifications, and he was required to supply an affidavit to that effect.

Prices of raw materials were climbing upward, consequently prices of paints had to go up too. And, as the demand for industrial paints was brisk, it was natural for producers to try to increase the margin between cost and selling price—especially because it had been so little for so long.

Rather suddenly something happened. Prices of specification goods skidded, as if on a late spring snow, and scooted right down the hill. What stopped the uptrend and started the down? The coming of the ceilings could hardly have caused a decline of such extent. Was it because specifications tend to put all brands on the same level of quality, leaving competitors no advantage to offer except lower price? Lower price is apparently what each one aimed at, till now.

Lately, the approved list is being encountered again. Is it because some firms tried too hard to meet a specification — just barely?

After the war it may be easy for paint manufacturers to assemble new sales organizations. It looks as if that is what they will have to do. For few industrial field men can linger long if the reported practice of figuring the salesman's pay on specification paint on a 1% basis, becomes common; 1% of sales, out of which he must get his living and his traveling expenses. Interesting questions? Serious, too.
—PAINT SALESMAN.

D. G. Yarnall Dies

An announcement from Yarnall Paint Co., Philadelphia, Penna., states that Mr. David Gould Yarnall, president and one of the founders of the company, which he served continuously since 1885, died May 27.

From microscopes to battleships

MURPHY Protective Coatings

are meeting WAR needs

Whether the finish must meet the protective requirements of high precision instruments, or the grueling conditions encountered by naval vessels, Murphy has what's needed.

In plants throughout the country, Murphy Protective Coatings are now going on an impressive variety of products and equipment required by our armed forces . . . We, therefore, know what is demanded of a finish—as well as what your plant needs *to get the job out quickly.*

• Put it up to Murphy •

We began our war work with a background of more than 75 years of experience in meeting the *varied requirements* of industrial concerns. Precious time was, therefore, saved by our ability to provide the right finish for each purpose.

VICTORY FINISHES

To those engaged in normal production, we now offer Victory Finishes which require no priorities.

Whether your problem involves war work or civilian commodities, ***put it up to Murphy.*** Drop a line to our nearest office.

MURPHY VARNISH COMPANY

NEWARK SAN FRANCISCO CHICAGO

MURPHY

Industrial Finishes

The Finishing of Early C

I have been a reader of your fine magazine, "Industrial Finishing," for many years.

Have been directly connected with finishing for the past 20 years in the Middle West and the Pacific Coast, both on wood and metal.

For several years I was connected with a paint, lacquer, stain and filler manufacturing company in the city of Chicago, in the capacity of "Service Man." Am now located in Los Angeles, California.

I am enclosing a finishing procedure on Finishing Early California Furniture, which may be of interest to your many readers of "Industrial Finishing."—CLAUDE A. BAER.

WITH the building of hundreds of new homes here on the Pacific Coast, many of which are of Spanish design, it is imperative that they be furnished with furnishings that are in keeping with the architecture. Therefore Spanish designed furniture has become very popular. While this type of furniture is finished entirely different from the conventional furniture, it is particularly attractive in the respect that it is finished in soft tones of color, suggesting restfulness.

Early California furniture as now designed, has scalloped edges, much in resemblance of Colonial maple, which gives it a worn or aged effect. Several different kinds of wood are used for this type of furniture, some of which are white pine, alder, gum, redwood and poplar.

Wrought iron has been used for drawer pulls, stretchers, etc., but due to the present demand for steel and iron for defense work, metal is rapidly being replaced by wood with excellent results.

BY

CLAUDE A. BAER

A wagon-wheel motif group by Roberti Bros., shown in their desert tan finish. Photograph, courtesy of Los Angeles Furniture Mart.

California Furniture

This is the classic type of Early California which has never waned in popularity; wrought-iron hardware and braces, fiber wrappings, gay hand-painted flowers and a sturdy air distinguish it. Photograph, courtesy of Los Angeles Furniture Mart.

"Scratch" Sanding

Before the pieces are assembled in the cabinet department they are sanded at the belt sander with a very coarse sandpaper, so as to make impressions into the wood, being careful to follow the grain. This seems to be the general procedure. However, the same result can be obtained by using a wire buffing wheel, but more time is involved, hence it is more expensive; and, due to the irregularities in pressure, etc., on the part of the operator, it is much more practical to use the belt sander method.

It is important that these scratch marks or impressions, made by either method, be kept reasonably uniform; they must not be too shallow or too deep. The ultimate finish depends largely upon this operation. After this is completed, the pieces are assembled and dusted with the air duster to remove all dust from the wood surfaces. Then the furniture in the white is ready for the finishing department.

Light Tinted Undercoat Applied

The first operation in the finishing department is the application of a semi-flat opaque lacquer undercoat. A choice of many light tints of undercoat can be used. Some finishers use a pure white undercoat. Others prefer an off-white or light buff. However, a white undercoat, tinted with a trace of ultra-marine blue and medium yellow added, makes an excellent color for this type of finish.

The undercoat should be pigmented enough to give good coverage with one coat. Care must be taken so as to avoid applying too much material on horizontal surfaces, as this seems to be quite a common practice with some operators. If too heavily coated, this

will cover the detail created by the "scratch" sanding, which results in a poorly finished product, therefore it is essential to keep it uniform.

After the undercoat has been applied it must dry from two to four hours, depending upon room temperature and drying conditions. It is then sanded lightly with No. 6/0 fine sandpaper to remove all grit that may be present.

The glazing stain is available in many shades but generally a warm brown color is selected, as this seems to be accepted as correct due to the fact that it is used over light tints of undercoat which, in conjunction, makes very soft tones of color, and produces color harmony as well.

The glazing stain can be reduced with naphtha, oleum spirits or turpentine — sprayed or brushed on. Oil colors are generally used, so as to allow time for blending out. Cheesecloth, brushes or fine steelwool may be used for blending or highlighting. If steelwool is used, care must be taken so as to get all the fine steelwool dust and particles off the surface before proceeding with the lacquer coat.

After the glaze has been allowed ample time to dry, the surfaces are ready for a coat of clear flat lacquer. A 21% solids lacquer is reduced 20%, or four parts lacquer to one part of lacquer thinner. Two to four hours drying time is required.

The piece is now ready to be decorated. Decorations are usually hand painted in oil colors by artists, and some very beautiful designs and effects are obtained.

When this work is completed and the decorations are entirely dry, wax may be applied to make the product appear more authentic. When dry, rub off and follow with rottenstone, which is dusted over the entire piece. A clean soft cloth is used to take off the surplus dust. This has a tendency to subdue the colors and at the same time enhance the beauty of the finish, giving it an aged effect.

Makes Brass Clean

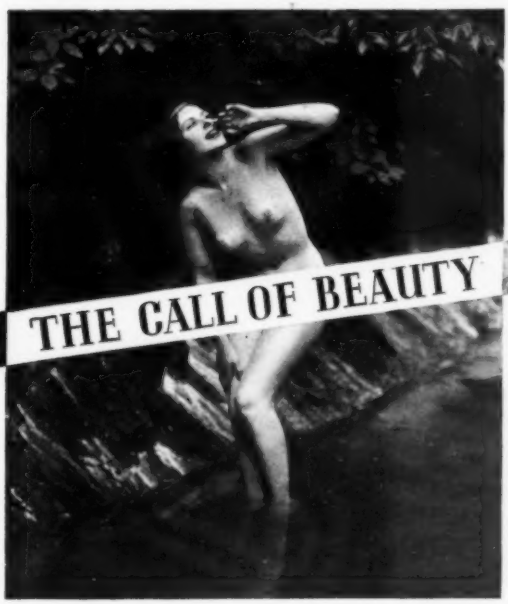
A TROUBLESOME problem in the manufacture of brass cartridge cases has been solved through the use of a common and well-known chemical — ferric sulfate — according to J. J. Healy, Jr., development director of the Merrimac Division of Monsanto Chemical Co., Everett, Mass.

Ugly red cuprous oxide stains and black smut are frequently left on the surface of the brass after the heat-treating operations used in cartridge case manufacture. These stains have been difficult and sometimes impossible to remove by the usual acid-pickling methods. By using a pickle solution containing ferric sulfate in addition to the usual acid, however, complete removal of stain is being achieved.

Sulfuric acid alone will remove the more common black cupric oxide, but it is not effective against smut or red stain, with the result that these blights have been a cause of trouble in the pickle room.

To assure complete elimination of stain, ferric sulfate should be used in each pickling operation, starting with the first anneal. If any red cuprous oxide or black smut remains after pickling, and is subsequently drawn into the piece, it becomes difficult to remove.

The use of ferric sulfate in pickling cartridge cases not only improves the final finish but produces a finish more satisfactory for intermediate draws.



Whether it applies to people or products, beauty is an important factor in meeting the public because first impressions are usually lasting impressions. The call of beauty is irresistible . . . and to capitalize upon it in marketing your products we offer the facilities of our Creative Studio. In this studio new and original finishing schemes, equal to or superior to materials formerly available, are created for all types of products made of either wood or metal. Let us analyze the finish of your products and submit our ideas for consideration. There is no charge to reputable firms for this service.

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ROCKFORD, ILLINOIS

SUBSTITUTE COLORING OF METAL PRODUCES

Bronze Powder Effects

BY AUGUST L. MEDEL

MANY bronze-powder finish effects can be produced directly on the metal itself, without the use of bronze powder. Light bronze finish effects can be produced on brass, either sheet metal or castings. Darker bronze finishes can be applied to bronze metal or copper-plated brass or steel. Copper plated metal gives a darker finish than bronze metal.

Castings are polished with No. 70 emery. One reason for using this grade of emery is that it will take the skin off the casting at a low labor cost, but the most important reason is that the sandblast will remove all of the emery marks.

For light finishes, use brass. For darker browns, use bronze. For brown to black, use copper-plated metal.

The following solution is for light finishes. Add 4-oz. of liver of sulphur to 30 gallons of water heated to 120° F.

After the articles to be finished are sandblasted they are ready to be stained. To stain, immerse the articles in hot water, then in the solution just described. From there transfer them directly into a toning solution made up by adding a gallon of sulphuric acid to 30 gallons of water. (Note: Make sure acid is added to water.) Then give them a cold-water rinse followed by a hot-water rinse. Dry them in hardwood sawdust. Scratch-brush the surfaces with a brass-wire brush.

The coloring will depend upon the number of times you repeat the operations just specified. The more you dip the articles, the darker the finish will be.

After brushing the treated surfaces, gives them a coat of matt lacquer for a dull finish or gloss lacquer for a shiny finish.

If a silver color is desired, it can be obtained by: Sandblast first, then bright dip, silver plate, dry out and scratch brush.

If you silver plate a bronze article for about one minute and brush the surface with a steel wire brush, so as to cut it through (that is remove some of the silver so the base metal shows through) you will then have a silver bronze finish.

For a light brown to dark brown color on bronze metal, use the following solution: Mix into one quart of warm water:

Barium sulphide	2-oz.
Liver of sulphur	4-oz.
Aqua Ammonia (No. 26)	8-oz.

When dissolved, add to 30 gallons of water heated to 120° F. Use this the same as the other solution. It is advisable to make a new solution every day for best results.

These finishes can be brushed wet, which gives a soft finish. If

● Metals that wage a war must be protected from corrosion and rust. Radio and other communication equipment, mobile units and soldiers' cots, camouflage scaffolds . . . equipment ranging in importance from soap-boxes to battleships. Hundreds of products for the war and home fronts must have their surfaces treated to protect them and conserve their usefulness. Delivery dates must be met and these finishes must give trouble-free performance so that top-speed production can be maintained.

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- To *Engineering Department*

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H. A. B.

WRINKLE FINISH AIDS IN DEFENSE

Many pieces of Army, Navy and Air Force equipment are finished in Wrinkle. Its use hastens delivery and because only one coat is required conservation of material is achieved.

WRINKLE FINISH IS THE ANSWER TO FINISHING ALTERNATE MATERIALS

Aluminum and other critical materials are "out" for low priority and non-defense items, hence manufacturers are re-engineering their products to use the more plentiful metals and finishes.

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Chromium finish	Wrinkle Finish	

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Write for a copy of "New Wrinkles in Finishing". Contains many helpful suggestions for product finishers.

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the wet method is used, it must be remembered that after you complete the brushing—that is, until you have the color you want and the article is still wet—that is the way it will look when it is lacquered.

In order to keep the same color on the whole job, keep the first article brushed as a sample. Keep it wet and match each piece to this one sample.

Articles finished in this manner will keep their color much longer than those coated with regular bronze powder finishes.

How to Use Varnish Removers

IN A RECENT issue of this magazine, I noticed a request by the F. Furn. Co. for an article on varnish removers and their use.

For several years it has been customary for foreman finishers to use lacquer reducer for removing (or "stripping off", as it is sometimes called) varnish, lacquers, etc., from furniture that is to be repaired and refinished. Now, due to defense demands, lacquer thinners are becoming increasingly difficult to obtain. Most of us will have to turn to some cheaper material that can be easily obtained.

Several varnish removers are made from benzol and wood alcohol. This combination makes an effective remover. However, benzol is toxic and injurious to the health of any workman if he inhales it over a long period of time. While alcohol is hard to get, the benzol-alcohol removers are being used because they are easier to obtain and are cheaper than good lacquer reducers.

The next best removers are made from high aromatic solvents such as toluol or hydrogenated naphtha, with alcohols and acetone; but these reducers are harder to obtain because of the scarcity of toluol and acetone.

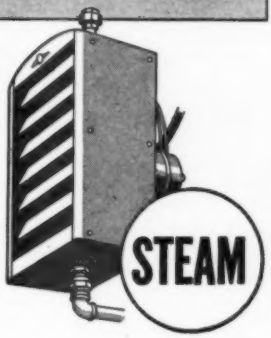
Some varnish removers contain wax. This type of remover works best on pieces of furniture that have been finished for months or years, as the wax slows up the evaporation of the remover, making it stay wet longer, hence its softening action is quicker on the film to be removed. Much care must be exercised when using this wax-type remover to avoid leaving any of the wax on the surfaces to be refinished. If wax were left on such surfaces it would cause the finish to remain soft and not dry as it should—and probably the finish would peel off or scale off later.

After removing the finish with a wax-type remover, all cleaned parts should be washed clean with denatured alcohol. This will remove all of the wax residue.

Perhaps the best method of removing the old finish is to use a vat in which to put the articles to be washed. Put the pieces to be washed in the vat and let them soak a few minutes; then use a rag or pad of steelwool, dipping this in the remover and then washing with the grain of the wood while the piece remains in the vat. After all of the old finish is off, remove the piece of furniture from the vat and wipe it clean with a soft cloth, being sure that all remover is wiped from the piece washed. Then allow the washed piece of furniture to dry for about two hours. It is now ready to refinish.

Where the piece of furniture is too large to be put into a vat, I suggest using a bench the same height as the sides of the vat. The

Improved Protection for Steel Tubing and Radiators



BERRY BROTHERS

THERMOSET CLEAR

Berry Brothers Thermoset Clear No. 11 provides a new and highly improved protective coating for fin and tube type radiators, with high resistance to humidity, chemical and salt exposure. Among tests successfully completed was one of 100 hours' continuous live steam at 60-lb. pressure, followed by 50 hours' salt spray. Another salt spray test was discontinued after 400 hours without breakdown. Berry Brothers Thermoset Clear No. 11 is actually a plastic moulding material in liquid form. Heat hardens it. Unaffected by most common solvents, acids and alkalies. Bakes in 30 to 45 minutes at 350°. 2A priority. Write for further information.

Bulletins on government specification finishes on request.

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piece of furniture can be put partly over the vat, so as to wash it and allow the unused "rundown" to drain back into the vat.

Whenever or wherever a vat is used, a cover should be kept on the vat when it is not in service, so as to avoid any evaporation of the remover material in the vat.

Another method is to brush the remover on the finish to be removed. Keep brushing it on so as to keep the surface wet until the old film gets soft; then use a putty knife or cabinet scraper to lift the film to be removed. This should be followed by a sponging of all the surface with some of the remover on a soft rag. This will remove all streaks left when scraping.

Still another method of removing the old finish from furniture is to spread several layers of old cloth or burlap on the surfaces to be cleaned and then pour the remover on this covering. This will keep the surface wet until the old film becomes soft. Then follow by scraping and sponging the surfaces.

Some concerns are having their varnish removers reclaimed and using them again. Perhaps, due to their scarcity, there will be more lacquer thinners, removers, etc., reclaimed in the future than in the past. I understand there are several companies who specialize in reclaiming used solvents; also, there is equipment on the market for this purpose.—H. W. CHESTER.

This Mr. and Mrs. chest is of bleached mahogany with the front enameled in frosty white. It is designed for use in living room, dining room or bedroom, providing ample storage space for linens, silver, clothes, etc. The pulls are solid brass. American Furniture Mart Photograph.

Conveyors; Lighting; Layout; Ventilation

MORE than a mile of conveyor lines simplify and expedite materials handling and assembling operations in the revamped and expanded Cleveland Lighting Division of the Westinghouse Electric & Mfg. Co. In order to double the rate of production, as a result of increased defense orders, it was necessary to completely revise the existing plant layout, using roller, belt, and monorail conveyors to tie in with increased production facilities provided by a new two-story manufacturing and storage building.

Due to space limitations and available transportation facilities, most efficient production is realized by establishing a "C" shaped material flow layout. Overhead and roller-type conveyors are used extensively to move the parts going through various stages of assembly. Raw material shipped by both rail and truck is received at one point. A storeroom is located near

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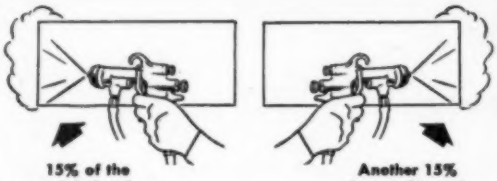
• Speed-up hints on wartime fini

1. WATCH TRIGGERING OF SPRAY GUN FOR MORE EFFICIENCY

▶ To get the most efficiency from spray operators and prevent waste of vital finishing materials . . . reduce your "overspray." This is the paint mist which falls beyond surface to be covered. One cause of "overspray" is the *whipping* of the gun by the sprayman. With such rapid strokes, proper triggering at the end of each stroke is practically impossible.



2. THIS IS HOW TO WASTE ENERGY AND MATERIALS

▶ Haste makes waste. Slow, steady strokes get more work done with less materials sprayed into the air. To prevent overspray, trigger should not be pulled when gun isn't on the mark. Gun should be triggered *before* and *after* every stroke.

3. TRY THIS EFFICIEN

FIRST... "bond in" the edg[e] each panel,
THEN... spray the face of [the] horizontal

▶ After the ends are "bo[nded] in," the stroke and *then* pull the [gun] completing stroke. This [gives] minimum waste from over[spray]. Incid[entally] sprayed so that both sides [of] corner are

e finishing...*from the Du Pont Man* •

HIS EFFICIENT SYSTEM

" the ends of each panel, moving the gun vertically. e face of panel horizontally, triggering each stroke.

s are "boxed in," the operator can begin each pull the trigger. He can release trigger *before* ke. This gives smooth, complete coats with a from over-spray. Incidentally, corners should be oth sides of corner are covered at the same time.

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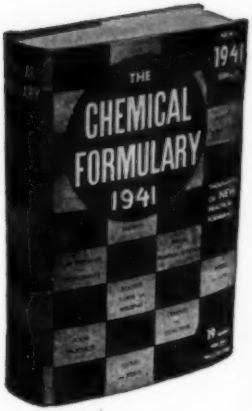

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Pyrotechnics
Solders
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INDUSTRIAL FINISHING *Magazine*

1142 North Meridian Street **Indianapolis, Ind.**

the receiving department, since only about 15% of the material received goes directly to the production floor.

Most of the lighting fixtures and Precipitrons do not lend themselves to straight line production methods since each order is routed individually. A study of production conditions revealed that by interposing "matching centers" at certain points between successive manufacturing operations, a nearly "straight line" flow could be obtained. The principle of progressive flow with lateral feeders, is applied to the layout, and the "matched centers" serve to take up the slack and smooth out interruptions.

Dispatch Station Control

Full control of work assignments center in the production dispatch station. The dispatcher routes the required materials to the manufacturing department, usually with drawings and tools necessary to perform the operations specified. After these initial operations have been completed, the work is returned on conveyor lines to the dispatch station where it is reassigned until all of the so-called "feeder operations," such as metal stamping, machining, spinning, painting, etc., have been completed. The material is then sent to the finished parts storeroom or a second dispatch station depending on its classification. If it applies to a customer's order, it is matched with other parts for assembly and direct shipment.

Since about 90% of lighting fixture parts are standard, a policy of stocking parts rather than finished units is adopted. Result is smaller warehouse stock and quicker service to customers.

Interior walls and roof deck have been painted white to insure maximum illumination. Fluorescent lighting throughout the department has been worked out to afford 35 foot-candles of illumination. Overhead bus ducts are used to provide convenient power connections to direct-drive equipment.

Ventilating Paint Room

Special ventilating facilities for the paint room reduce fire hazard and improve working conditions. The department is equipped with baking ovens and is served by a conveyor line which delivers parts direct, to and from the paint spray booths and production lines.

Chicago Furniture Factories Form Pool for War Work

The first concrete and full-scale program for converting Chicago's furniture manufacturing industry to war production was adopted at a general meeting of the Chicago Furniture Manufacturers Association on June 18th. Acting on advice from the War Production Board, the group unanimously approved the immediate formation of a pool of between 10 and 15 furniture manufacturers who are to be prime contractors for handling war orders, with the rest of the manufacturers serving as sub-contractors out of this pool.

This method was devised because the WPB stated that the Chicago furniture industry—by far the country's largest in one compact geographical area—is too big for all to become members of one pool. All bidding and allocation of contracts for the pool, termed the "Chicago War Wood Industries Committee," will be cleared through the office of the association's executive director, A. D. Gorrell, with quarters at Room 900, 7 S. Dearborn St., Chicago.

Such technical advisers as may be needed will be employed, as it is the group's intention to handle any type of war product requiring wood. Organization of the pool's details are being worked out with Charles Frey, Office of Production Management, Division of Contract Distribution, WPB's Chicago office, after which names of the prime contractors will be released.

A survey of the association's facilities, conducted for the especial purpose of showing members' potentionalities for conversion, was recently completed and taken to Washington by a committee.

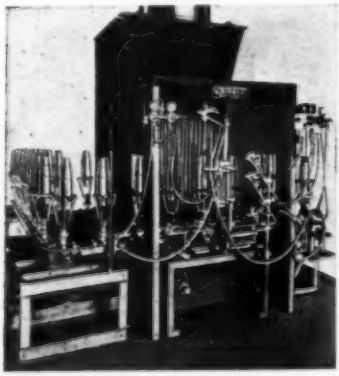
Automatic Shell Coating Machine

The accompanying illustration shows a typical automatic spray-finishing machine for spraying the inside and outside of 75-mm. to 105-mm. shells automatically, at the rate of 200 to 500 per hour.

Shells are loaded on a moving conveyor in a specially designed workholder, which holds them in place. As these pass in front of the water-wash spray booth, an oscillating mechanism engages the spindle of the work holder, rotating the shells in front of the automatic spray guns, which spray the exteriors. The shells then pass, still rotating, to the position where a pneumatic spray gun plunges down into the interior cavity of the shell as it rotates, completely spraying the inside. Shells then pass away from the oscillating mechanism, and continue on the conveyor for the required length of time to completely air-dry. They are then unloaded and packed for shipment to the shell loading plants.

The unit is equipped with an ingenious device known as a "skip spray" unit, which is so designed that should a shell be missing on the conveyor, the gun will not spray. Thus no paint is wasted or lost.

The manufacturer, Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill., makes a complete line of automatic, semi-automatic and manual spray-finishing equipment for spray-painting shells, bombs, fuses, tanks, guns, aircraft and other war needs.



Paints outsides and insides of shells automatically—but skips any empty holders.

New . . .

MATERIALS SUPPLIES EQUIPMENT

Anodic Degreasing

Specially designed to meet war demands for faster cycles in anodic degreasing or reverse current cleaning of cold-rolled steel parts before finishing, a newly developed alkaline-type material has just been announced by the Technical Research Laboratories of Oakite Products, Inc., 32 F. Thames St., New York, N. Y. This development is now being successfully used to speed up production of a wide range of war supply items, such as gun mechanisms, control instruments, aircraft forgings and bearings, airplane propeller hubs and engine parts, armor-piercing shells, and tank transmission gears and tread parts.

Known as Oakite Composition No. 90, this new material is reported to provide several original, exclusive features which mark it a basic contribution to faster production, more uniform results, low unit cost and long solution life. Due to its high conductivity, ready adaptability to hard water conditions, effective smut-removing properties and fast wetting-out action, the material is said to remove oil, grease, smut, polishing and buffing compounds on the consistently thor-

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ough, speedy basis required where a large volume of work is handled, and where fast effective soil-removal is essential. The material, it is claimed, has been found particularly advantageous to plating departments and contract finishing shops using the Bullard-Dunn Process for the tin-coating of steel parts.

Spray Booth for Bombers

Soon, in one of the big aircraft plants, the world's largest waterwash spray booth will be in operation. It will be 152-ft. long, 100-ft. deep and 31-ft. high and was designed and built by DeVilbiss for painting large bomber parts and complete planes.

The accompanying illustration shows one of the eight compartments that will be assembled into the mammoth installation, as compared to the size of an ordinary industrial spray booth. These compartments will be assembled in pairs, side by side, with an intervening 6-ft. space between pairs to accommodate motor-driven accordion partitions—31-ft. high and having a 100-ft. span. Folding partitions are also mounted on the ends.

The booth's design has several advantages. Because of its sectional construction and folding partitions, it can be used as one enormous spray booth with 15,200-sq.ft. of floor space or it can be cut into two, three or four booths, each large enough to accommodate a bomber's fuselage less its wing surfaces. The maximum booth space will permit a complete large size bomber to be wheeled in for painting.

There are many interesting angles in the remarkable efficiency of the exhausting facilities of this equipment. The wash-down curtain in each compartment, as shown here, is 20-ft. high and water cascades over it at the rate of 24,000 gallons per hour. This means a water fall of 192,000 gallons an hour for the complete installation —a virtual Niagara.

Air is drawn through the curtain of water in each compartment by two fans—each 48-in. in diameter and each driven by a 7½-hp. motor—developing

An ordinary factory spray booth looks small in comparison to this one of eight compartments each 31-ft. high.

a capacity of 31,000-cu.ft. of air per minute for each water wash compartment. Thus 62,000-cu.ft. of air per minute is drawn through each of the eight sections. With the entire installation in operation, the 16 fans will move a total of 496,000-cu.ft. of air per minute. This exhaust system assures the complete removal of spray vapors from all parts of the booth, even on the largest painting jobs.

The design and construction of this giant spray booth marks a long forward step in speeding the bomber output and in achieving the goal of mass war plane production. It is a product of The DeVilbiss Co., Toledo, Ohio.

Glidden Appoints Chicago Sales Manager

Nat Armel has been appointed sales manager of both Glidden Industrial and Nubian Division and will be in charge of the sales and service departments for that division, according to a recent announcement. Mr. Armel will be located in Chicago.

IT'S A FIGHT TO THE FINISH

No matter how good the fight—it's the finish that counts!

And it's the finish that counts on our fighting equipment. The best of this equipment would corrode and wear out in a matter of weeks—months at most—if not protected by tough, durable finishes.

The research facilities at A&W have been given over to developing finishes that will make American equipment longer-lasting, tougher, superior. A & W has the technical background and the manufacturing capacity. Perhaps you have a finishing problem for which our research has the solution. Try Ault & Wiborg, 75 Varick Street, New York City.

A & W FINISHES ARE USED ON 85 WAR ITEMS FOR EXAMPLE:

- AIRCRAFT ACCESSORIES
- AIR FILTERS
- AMMUNITION CHESTS
- BOMBERS
- BOMBS
- ENGINE PARTS
- EXPEDITIONARY CANS
- GUN MOUNTS
- INCENDIARY BOMBS
- INSTRUMENT PANELS
- MACHINE TOOLS
- MINES
- RADIO EQUIPMENT
- SHELLS
- STANDARD ASSEMBLIES
- TRANSPORT VEHICLES
- TOOL BOXES
- WIRING SYSTEMS

A&W RESEARCH SOLVES FINISHING PROBLEMS

Water-Wash Airfinishing Booth

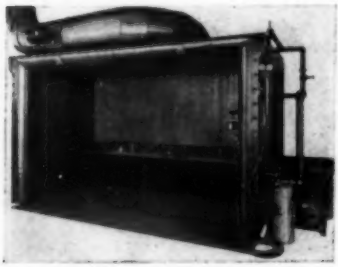
The Paasche Airbrush Co., 1917 Diversey Parkway, Chicago, Ill., announces a new type water-wash airfinishing booth designed to eliminate time-consuming booth cleaning operations and assures clean exhaust. In this booth, over-spray that usually accumulates on walls and exhaust duct and fan is washed down into a settling tank by action of water curtains and water wash chamber.

In their construction, the urgencies of war-time production have been considered and time-savings features incorporated. The booth illustrated has a water curtain on three sides, but is also supplied with a water curtain at the rear only, or on three sides and bottom also. To form the curtain, five gallons of water per minute flows smoothly and completely over every lineal foot of baffle. Exhausting air is drawn against and through the water into a large water-wash expansion chamber where it is thoroughly washed by high-velocity sprays from two rows of non-clogging nozzles.

All paint particles are precipitated into settling tanks. Two sets of eliminator packs, above and below nozzles are provided. The lower pack is constantly washed and cleaned by spray while the upper pack removes water from exhausting air. This self-cleaning action saves time and material by eliminating the usual manual cleaning.

Water is continually circulated by high-quality centrifugal pump. Solids are prevented from re-entering the circulation system by double screening.

"Snap-on" baffle plates can be taken off quickly to inspect the water-wash chamber or to remove eliminator packs. There are no troublesome nuts and bolts to remove—a feature that saves considerable time.



Water curtain on three sides if you want it.

Collects Fine Dust

It is well known that very fine dust particles are exceedingly hard to control and harder to trap and hold. The particles are often so fine as to be hardly visible to the naked eye, yet they are the most efficient in piercing the human defenses against dust diseases—and naturally they are objectionable when they alight and stick on a freshly painted or varnished surface. A solution of this annoying problem, which is present in practically every factory or workroom, has been developed and is presented here.

Inside the rectangular metal cabinet shown in the accompanying illustration are from 12 to 66 cloth bags of specially woven cloth especially designed for this one purpose alone—that of separating the dust from the air so that the dust remains in the cabinet while the air passes out into the workroom again, pure and ready for breathing.

Here the stream of air suction, drawn from the point of dust creation, passes through a pipe to the cabinet. A powerful motor-driven suction fan creates this suction. As the air

Are You MAKING THESE IMPORTANT WAR ITEMS *for Uncle Sam?*

BUNK BEDS?

Then you should try these products which meet Specification 63A in every respect:

No. 8887 Walnut Penetrex *(Oil Stain-Sealer)*

No. 63A Specification Varnish *(Gloss Varnish)*

No. 757 Gloss Lo-Vis-Lac *(Gloss Lacquer)*

Send us samples of the wood you intend to use. We will finish them and rush them back to you with full details, using varnish or lacquer as you request.

CARGO TRUCK BODIES?

Look into these materials which comply fully with the requirements of Specification ES-680:

No. 407 Toxic Penetrex (Class 38 type I Rot Inhibiting Sealer)

No. 8110 Gray Primer (Class 2 Refinishing Primer)

No. 8121 Lusterless O. D. Enamel (Class 4 Lusterless O. D. Enamel)

OFFICE FURNITURE?

Don't overlook the solid covering, fast drying, smooth, economical one-coat enamel finish:

RV 8294 One Coat Olive Green

Or if your work calls for a transparent Olive Green Stain under varnish or lacquer use:

No. 8381 Olive Green Filler

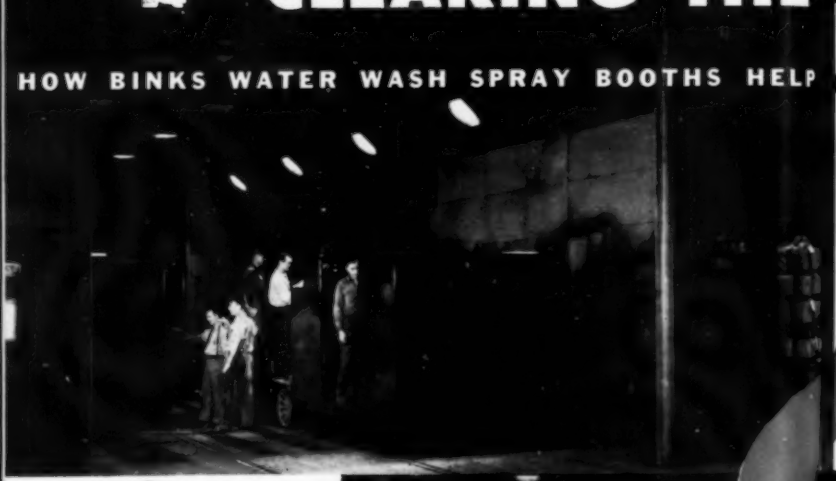
No. 8383 Olive Green Stain

As large suppliers of aircraft finishes to the government, we solicit enquiries on plywood glider and plane finishes.

RELIANCE VARNISH CO., INC., LOUISVILLE, KY.

CLEARING THE AI

HOW BINKS WATER WASH SPRAY BOOTHS HELP TO K



General view of Binks Down Draft Water Wash Spray Booth described to the right.

The same booth showing the filters in the ceiling through which clean air enters, and the grills in the floor through which fumes and dust are exhausted. Arrows show direction of air movement.

BINKS MANUFACTURING COMPANY 3114-31

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IR FOR ACTION

KEEP FINISHING AHEAD OF PRODUCTION

Control of paint fumes and dust in finishing departments is doing much to speed up production, protect employee health, increase morale, and to give better finishes with fewer rejections.

The Down Draft Spray Booth illustrated to the left was recently designed and installed by Binks in a new Westinghouse East Pittsburgh paint shop. Like other Binks installations of this type, this one is tailormade for the specific job to be done. In this case switchgear panels and switchboards travel from the assembly aisles through the paint shop to the shipping department on flat-topped trucks which run on tracks. These trucks run through the Binks Down Draft Water Wash Spray Booth. Doors at each end of the booth close it tightly when it is in use. Fresh, clean air enters the booth through filters in the ceiling. Paint fumes, dust and other impurities in the air are quickly exhausted through grills in the floor. All exhausted air is thoroughly washed under the booth before it is vented.

This installation is typical of many designed, built and installed by Binks for war industries where better and faster operation has been needed to keep finishing ahead of increased production. The same engineers who designed these installations are at your service when you need them. Please feel free to call upon them at any time.

To be sure of the best in spray-painting and finishing equipment, remember to ask for BINKS. Send today for a complete Binks Catalog Data Book.

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BOSTON - LOS ANGELES - SEATTLE - WINDSOR, ONTARIO, CANADA

JETAL, the original black oxide finish for iron and steel, is fully described in this new booklet just off the press. It contains important data . . . shows effect of treatment time, bath temperature, bath composition and surface hardness upon the protective value, penetration and wear resistance of oxide coatings. Learn how JETAL increases abrasion and wear resistance from 50% to 230%—How JETAL, with protective oils and lacquers, assures high salt spray resistance . . How JETAL increases production 100% and saves 30% in price.

JETAL is immediately available in any quantity and, in this emergency, makes an ideal substitute for nickel, zinc, cadmium and tin plating. Send samples for JETALizing without charge.

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ALROSE CHEMICAL CO.

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passes through the cloth the dust remains on the interior surface of the bags to be shaken off by means of a hand shaker attachment or a motor-driven one which works automatically if so desired.

The dust dropping off the bags collects in the lower compartment. The greater part of the dust, and especially the heavier parts, never even reach the cloth strainer bags. It is trapped in this lower compartment on account of the slower action of the air there. This compartment may be cleaned at convenient intervals. A removable panel in the cabinet makes it possible to expose and examine or replace the cloth strainer bags at will.

The dust collector may be attached to individual machines or groups of machines such as grinders, polishers, sandblast machines, etc.—in fact any sort of device where dust is created in the course of operation and may be used with or without an outside exhaust as desired. It is a product of Leiman Bros., 120 Christie St., Newark, N. J.

Weld Spatters Made Harmless

A new product, Acme Quality Industrial Finish Flash-Off No. 99, which is designed to eliminate weld spatters and the time cost of removing them, plus giving a stronger, smoother weld, has just been introduced by the Acme White Lead and Color Works of Detroit, Mich.

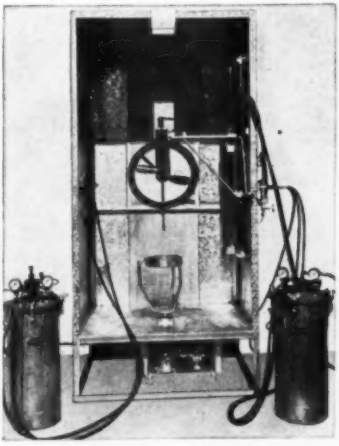
"The use of Industrial Finish Flash-Off," says the chief chemist of the Acme research and testing laboratories, "is the very essence of simplicity, and desired results are certain. The mechanic simply brushes, sprays, or wipes on Industrial Finish Flash-Off along the edges of the metal surfaces to be joined by the weld. Then, when the welding is being done, metal chips bounce or fall off instead of adhering to areas adjacent to the seam. This eliminates the necessity of grinding or scratching these chips off. The seam is smoother."

An additional feature of the new product is its cleansing effect to the surface to which applied. It prevents pitting on galvanized or ungalvanized metal surfaces and permits immediate application of paint without cleaning operations other than wiping off.

The new product will be marketed in 55-gallon drums and 5-gallon cans. Write to Acme White Lead and Color Works, Detroit, Mich., Dept. FS-18, for further information.

Shell Sprayer

A special unit for spray coating 8-in. shells in a vertical position has been built by the Eclipse Air Brush Co., 400 Park Ave., Newark, N. J. The inside coating is done with a semi-automatic spray gun fitted with a long extension nozzle. The outside is sprayed manually by the same operator who handles the inside coating operation. The shell is rotated by an air-motored tripod with a ring at the top to protect the driving band from paint. The rate of production by this method of operation is approximately 25 pieces an hour.



Sprays both outside and inside of shells.

Noroy Shellac Blender

The Rudd Lacquer Corp., 127 Maiden Lane, New York, N. Y., announce a material called "Noroy Shellac Blender," which will convert one gallon of 4-lb. cut shellac into four gallons. It blends in equal parts with 4-lb. cut shellac and this blend can be cut further with an equal quantity of alcohol. The announcement states that this conversion produces a water-resistant finish that does not turn white.

The obvious purpose of Noroy Shellac Blender is to double the mileage of shellac and at the same time produce a better finish. The company offers a sample one-gallon can of this Shellac Blender at the drum price.

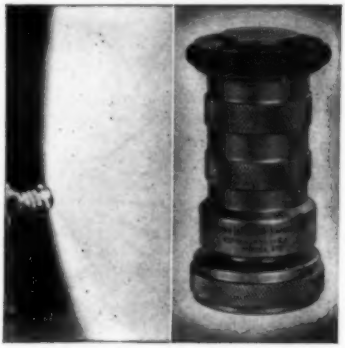
Nozzle to Spray Fires

To meet the demands for a variable all-spray nozzle, without a straight stream, a new water spray nozzle, the "Alfcospray," has just been introduced by the American-La France-Foamite Corp., Elmira, N. Y. From the shut-off position, a slight turn of the tip immediately gives a cone spray of 40°. Further slight rotation produces increasing cones up to a full curtain of 150°, with reversal back to shut-off position without any intervening straight stream.

This model finds favor with many companies, as it prevents any possibility of a solid water stream being applied inadvertently on live electric circuits. The varying cones are also excellent for extinguishment of heavy oil fires, and for general cooling purposes.

The nozzle can be furnished for any 2½-in. hose thread; also for Under writers' tip thread, 2-in. hose thread, or 1½-in. thread.

The Alfcospray nozzle in the full curtain position provides an effective water screen to protect men and property behind it. It proves more effective on Class A fires (wood, rubbish, textiles, etc.) with spray discharge, than straight bore nozzles, because the finely divided particles of water discharged in the form of a spray will allow absorption of a far greater amount of heat than a like quantity of water delivered in a straight stream.

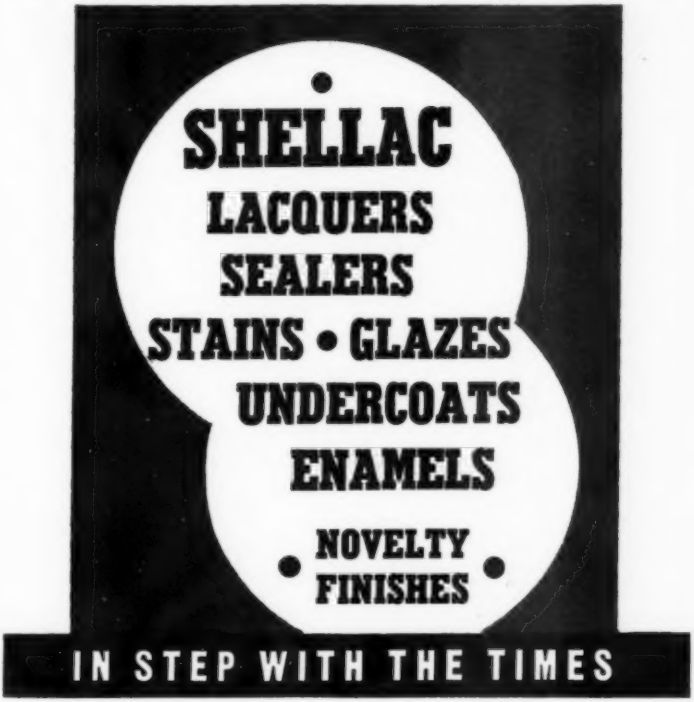


Alfcospray full curtain — Alfcospray Model 10F

Seals Porous Castings

According to information supplied by the Bakelite Corp., 30 E. 42nd St., New York, N. Y., porous or leaky metal and alloy pressure castings can be reclaimed by impregnating them with Bakelite sealing solutions. It is possible to salvage many intricate and essential castings which might otherwise have to be rejected. These sealing solutions have been employed for many years and have proved highly satisfactory for many types of aluminum, nickel, silver, bronze, and brass castings. They are being employed successfully by aircraft, automotive and electrical equipment manufacturers.

The use of Bakelite sealing solutions for porous castings insures the production of parts fully the equivalent of castings that pass the most exacting inspection and tests. Often, pores do not come directly to the surface of castings and they are not visible upon inspection. Proper treatment with sealing solutions will assure



Industrial Finishes

that make the most of available raw materials to give you greatest durability, together with attractive appearance and economy.

• FOR APPLICATION BY ALL METHODS

JAMES B. DAY & CO., CHICAGO

that under-surface pores are tightly sealed, thus eliminating the possibility of costly breakdowns in service. Castings treated with these solutions may be even more reliable than those that are apparently sound but which have small internal flaws that may open after the machinery is placed in service.

After being applied, the sealing solution must be baked to bring out its best properties. Properly treated and baked, it forms an inert seal, which is infusible and insoluble. It is not affected by hot or cold water, by steam or by temperatures up to 400° F. Although the casting sealer is resistant to most chemical reagents, one should consult the Bakelite Corp's. Sales Development Department if the solutions are to be applied to equipment used in handling chemicals.

Toluol Substitute

The Neville Co., Pittsburgh, Penna., announces Notol No. 1 as a substitute for toluol for use as a diluent in the preparation of nitrocellulose lacquers and for other similar uses.

According to the company's announcement, Notol No. 1 is a hydrocarbon solvent, high in aromatics. The nitrocellulose tolerance of Notol No. 1 is within 80% that of toluol, hence it may be used with but slight change in formulation as an effective substitute for toluol. In some instances, it may be found that the slightly more rapid initial evaporation of Notol No. 1 will necessitate the use of small additional amounts of butyl or amyl alcohols to present formulations calling for Ennjay No. 1 or Solvesso No. 1. Additional specifications can be obtained by writing the company direct.

V-Lac for Shellac

Here is a new product formulated to be used in place of white shellac, yet it is claimed to be more waterproof and more durable than shellac. It dries rapidly and can be recoated within two hours; can be used as a sealer or finishing coat.

V-Lac is thinned to a brushing or spray consistency with benzine, varnolene (mineral spirits) or turpentine. However, benzine is generally preferred because of its quicker drying time.

V-Lac should be applied in thin even coats, allowing sufficient drying time between coats. It is useful as a sealer coat or finish for various wood products, new wallboard or raw plaster. It will keep indefinitely in a sealed can, but should not be left standing in an open can for long periods of time. This new material is a product of 20th Century Paint & Varnish Co., 30 Roebling St., Brooklyn, N. Y.

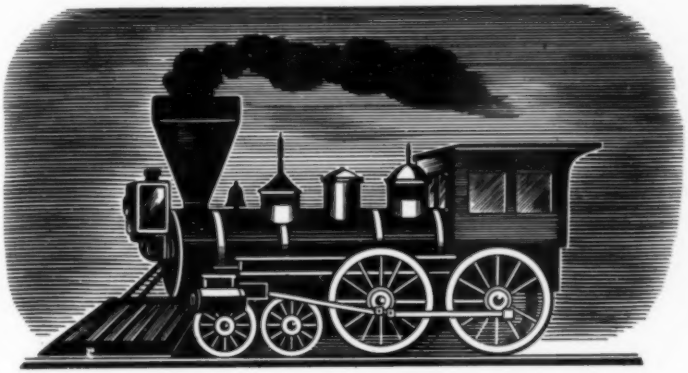
Temporary Coating Is Transparent

To reduce rejects due to rust, surface scratches, shop wearing, grease and dirt, a new protective coating for metal and ceramic surfaces is announced by Ault & Wiborg Corp., Cincinnati, Ohio.

Known as "Protektol Stripping Lacquer," the material is unique in that it is completely transparent to permit visual inspection of the coated parts. The plastic base coating is particularly applicable to highly polished surfaces such as flat sheets, molds, irregular shapes, dies and bearings; it offers protection during handling, fabrication, shipping, storage and installation.

The liquid can be sprayed, brushed, dipped or roller coated. It air-dries and leaves a flexible glass-clear coating of from .001 to .0015-in. in thickness. One gallon, when sprayed to a thickness of one mil, will cover approximately 250-sq. feet of surface. Drying time at 200° F. is six to eight minutes.

To remove the coating, it is necessary merely to lift one edge with the fingernail and peel it or blow it off with an air jet. The degree of adhesion to the part protected is controlled to eliminate the possibility of acci-



MODERN COATINGS

Until comparatively recently the American railroad speed record was held by a locomotive built near the end of the last century. A type long out-moded . . . but fast. Why out-moded? Because, although it possessed speed, it lacked power and economy . . . vital factors in modern railroading.

Product finishing presents an identical problem. Nearly every finish possesses some desirable qualities. Appearance . . . wear . . . heat resistance . . . economy . . . ease of application . . . requirements peculiar to your application facilities and product. The trick is to get them ALL. And this is obviously a job for expert finishing engineers.

The RIGHT finish can cut your finishing time, reduce your finishing cost, and increase the salability of your product. It can, in short, enable you to make more money.

Right NOW in the files of our research laboratories may be the formula which will do these things for you . . . and more.

Your inquiry incurs no obligation. Address Dept. "G".

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dental or premature removal. Water and sun-proof, the coating is not affected by most greases and oil. There is no deterioration or cracking at temperatures between zero and 200° F. It is also available in colors, making an ideal temporary identification medium.

After being removed from the article it protects, Protektol Stripping Lacquer may be returned and reduced to liquid form again. This process is very simple and may be repeated again and again, lowering coating costs to a minimum.

Furniture for Merchant Marine

SINCE the war has made the Merchant Marine such an important arm in our effort to achieve a final victory, I have taken it upon myself to acquire as much information as possible about the finishes used on furniture for the great cargo boats and oil tankers that ply the Atlantic.

According to an authority on the subject, the following procedure is used in finishing every item of furniture and interior woodwork that a certain large manufacturer turns out for these boats.

To begin with, there are only two colors used for wood furnishings in the whole of the Merchant Marine. These are light oak and medium dark mahogany. The color panels are obtained at the Maritime Commission in New York, N. Y.

Light oak is used on the furniture and paneling of the general offices and quarters for the crew. Mahogany is used on the paneling and furniture for the officers' quarters and passengers' accommodations.

The average crew on these boats numbers about 30 men, thus there are approximately 30 bunks, chairs, tables, etc., plus the large medicine chests and racks for any sick or wounded.

The light oak color is produced with a combination of oil stain and natural filler. When the coat of stain-filler is thoroughly dry the surfaces are given two coats of the very best spar varnish. The first coat serves as a sealer and is lightly sanded when dry.

The parts are all finished, "knocked down on both sides and ends," so they are completely sealed to exclude all salt air moisture. These colors are produced on all furniture of this type, which is made of solid oak. No veneer parts are used.

The mahogany color is produced with a quick-drying spirit stain sprayed on to give an even color. Then follows a dark mahogany filler, and finally two coats of varnish, the first coat being sanded.

When these finished "knock-down" parts are thoroughly dry, they are taken on trucks to the partly finished boats where they are installed and assembled by the ship's carpenters. When the boat has almost reached completion, finishers are sent on board to clean up the furniture in good shape and apply a third and final coat of spar varnish.—D. H.

Alfred University Honors Ferro Executive

On Monday, June 1st, the New York College of Ceramics at Alfred University, Alfred, N. Y., awarded the honorary degree of Doctor of Science to Robert A. Weaver, president of the Ferro Enamel Corp., Cleveland, Ohio.

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At Hilo, all facilities are devoted to the Protective Coating Needs of the Government Agencies for their direct use and you manufacturers who are using Government Specification Protective Coatings on what you are making for National Defense.

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Established 1863

NEW WOOD-FINISHING MATERIALS that save Hours and Hours!

● Here is good news for wood-working industries worried about the disappearance of the finishing materials on which they have depended for years. To them, Glidden offers this whole new series of *war-proof,* time-saving finishes!

"SURFACENE" COMBINATION STAIN AND FILLER—Combines these two operations, dries with superb clarity for sealing in 5 hours, cuts overall schedules 40 hours, saves application and handling costs.

"CLECO" VARNISH SEALER—Easy sanding in 2 hours, suited to either lacquer or varnish.

"CLECO" RUBBING AND POLISHING VARNISH—Dries out of dust in 1 hour, ready overnight for recoating, or to rub in 24-36 hours.

"CLECO" FLAT VARNISHES—Dry dust-free in 1 hour, hard overnight.

"SURFACENE" PIGMENTED WIPING STAIN for close-grained wood and **"SURFACENE" GLAZES** for plus tonal effects.

These *companion* products are made of NON-CRITICAL materials—availability is assured! Send finished panel and sample of unfinished wood for color matching, and our practical service man will make a demonstration at your plant.

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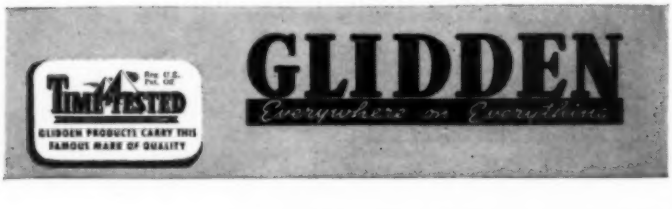

To Readers of Industrial Finishing

• Some of your own ideas about what INDUSTRIAL FINISHING's reading pages should contain, to help you now and in the future, can be expressed at this time.

This journal is designed especially to suit your professional requirements, and the editor wants to know what information you desire, what problems or difficulties you have and how we can assist you. It costs you nothing to make inquiries or to name subjects you wish to see discussed in the publication.

Every man occasionally feels prompted to "cut loose" and write some of his own experiences, opinions or ideas. INDUSTRIAL FINISHING solicits letters, criticisms and articles from practical and technical men in the industry.

Suggest any subjects you would like to see taken up by articles in the publication or tell us what subjects you are in position to write about for publication. Address—

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I am particularly interested in articles on—

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Name.....

Position.....

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Cleaning Screen Cloth

In our operations we have a finishing and cleaning problem which we find is expensive, and hope you may be able to recommend some equipment or process that will help us. We make window screen cloth, and before cleaning and electro-galvanizing, we also find it necessary to run the cloth through an open gas flame (propane) in order to burn off any grease.

We have not found any cleaning solution that cleans thoroughly enough to allow a wholly satisfactory plating job, and have therefore used the gas flame cleaning, which is expensive up here (Georgetown, Conn.). We have considered electrolytic cleaning, but not being familiar with the process and equipment, have done nothing about it. If you would advise us on this problem we would be very much obliged.—B. Mfg. Co. (Woven Wire Fabrics).

The cleaning can be readily handled in either an electro-cleaning bath or in a still tank. The electro-cleaning bath is recommended, and thoroughly satisfactory cleaning can be obtained through the use of Oakite Composition No. 90, at a concentration of 8 to 10-oz. to the gallon of water with reverse current at a current density of 40 amperes per square foot. The time of immersion will probably run from 30 seconds to 3 minutes.

The best equipment set-up would be an electro-cleaning tank, provision for spray rinsing, a pickling tank, a spray rinse, and immersion in the electro-galvanizing bath. The time of the cycle would have to be carefully worked out, based upon the length of time the cloth remains in the galvanizing bath. This could be readily varied in the cleaning bath by having the work make several passes over rollers immersed in the tank.

Provision should also be made for a low-pressure air blast to blow the cleaning solution from the screens as the cloth rises vertically from the bath; also a similar arrangement should be made to blow the rinse waters and the pickling solution out from the mesh. Wire mesh, as you realize, especially when clean, will tend to hold a solid sheet of whatever liquid it passes through. A light air blast will throw such liquid from the screen back into the solution container.

If a still cleaning tank is employed instead of an electro-cleaning tank, the same procedures would be followed, excepting that a longer period of immersion in the cleaning tank would be required. A different Oakite material from the one just recommended would be used with this latter set-up.

We are acquainting our representative in your section with your inquiry and we are asking that he drop in to see you. We believe a cleaning process such as we have outlined, can be readily made and that it will prove far less expensive, once installed, than your present method of burning off the

Questions; Answers

Questions are welcome and will be answered promptly by mail. Readers are invited to prepare and send in additional information relating to any of these questions and answers.

R
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The nearness of our plant to the sources of all raw materials essential for our products eliminates transportation bottlenecks.
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Airplane Plywood Finishing Bulletin
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DOPES — THINNERS
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Carlstadt New Jersey

cloth. It will also permit a substantial reduction in the strength of the pickling solution, inasmuch as this solution probably is now having to remove a considerable amount of the carbonized grease.

We are asking our representative to get in touch with you, and we will be glad to give you any additional information you may desire on an electrolytic installation for replacing your present method. In the meantime you may be interested in some of the data which appears in the booklet we are sending you. Oakite Composition No. 90 is a recent development for reverse current electric cleaning, but most of the general information appearing in this booklet, on pages 17 to 19, and which refers to Oakite Composition No. 54-B, is applicable to the same type of work. —OAKITE PRODUCTS, INC.

Plywood in Ship Construction

In the course of seeking additional information about the practice and possibilities of using penetrating waterproofing sealer treatment for the outer surfaces of plywood that enters into the manufacture of war products, the Editor has received many interesting letters. Some of them were published in the Question & Answer department of June issue. Excerpts from an enthusiastic advocate for gum plywood for ship construction, follows:

"Suspecting that there would be a shortage of wood material, we commenced communicating with government departments when war was declared by the United States. The subject of our writing was a gumwood plywood panel.

"The result of these communications has been the approval by the Navy Department of the use of a gumwood plywood panel for hull construction of certain types of naval craft.

"A few weeks ago the writer was in Mobile, Ala., and chatted with a lieutenant in the U. S. N. R. Just at that time the lieutenant was anxious for anything in wood in long lengths and widths that would act as an alternate to the regular contract stipulations of mahogany, fir, white cedar, and such woods that are difficult to obtain for various reasons. The lieutenant jumped at the idea of the gumwood panel.

"But it would seem that not alone he but other navy supervisors in the different districts of all states in the Union that border on the water and where naval activities are taking place, will be interested in finding a sealer or a prime coat for these gumwood panels.

"This gumwood plywood that we speak of is made on the hot-plate press, using as a bonding agent, "Tego," which is a phenolic resin film and when brought together with the wood under extreme heat and pressure fuses same into one piece just like a welded metal. The Tego is insoluble and it is impossible to part the wood from the adhesive, once it is bonded, and the first glue line is the water resistant.

"However, it is that outer ply that must be protected — not so much from the impregnation of water but from cracking through exposure to the salt water, sun and wind.

"You are interested in promoting finishes; so here you have a vast field where a good finish, or rather a prime sealer, will be very useful and play a big part in the execution of our present crisis.

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NON-INFLAMMABLE « *wax free* REMOVER »

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SPECIALTY COATINGS—I C. D. Labs. have specialized in the formulation and manufacture of non-inflammable coatings and substitute finishes. If you have a tough coating or finishing problem send in your specifications, finishing schedule and requirements. Immediate action and a prompt reply promised.

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- This blend can be cut with an equal part of alcohol.
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"In order to arrive at some practical manner in which this might be handled for the benefit of both the seller and the consumer, we might suggest to you that we give you names of people who are interested in gum plywood panels for boat building and have them write to you. In turn you could direct these letters to the people manufacturing these sealers that you have in mind."

(From Second Letter)

"You have a perfect conception of the gumwood plywood panel. It is constructed of plies of thin veneer and fused with terrific heat and pressure and welded into a solid mass, which is totally waterproof—in fact, boil proof. Today there are nails made which once driven cannot spring loose. These seem to have replaced screws and to give better satisfaction.

"The first glue line on this panel is the reinforcement and the resisting factor against water. So if this thin first ply can be impregnated with a waterproof sealer, then the job is complete and it would seem that destiny has drawn us together. . . .

"America is at war. We have to save our country and everything has to be done to do this. We think individul initiative and effort should be exercised by everyone and any ideas propounded should be presented to the proper authorities for considertaion. It certainly can do no harm, and if you had seen the eagerness and interest that Lieutenant ——— showed at our proposal of this gumwood plywood panel in large sheets that would require very little calking of seams, as compared to short and narrow material which was all that they could obtain, you would understand how anxious these men are for the suggestions of serious-minded persons.

"We shall certainly give you the names of any persons that we run across who are using gumwood plywood panels for boats, and shall certainly write to them and suggest that they get in touch with you and hope that we will get somewhere for the good of all. . . ."

It is apparent from this that here is a real opportunity for manufacturers of dependable and satisfactory penetrating sealer coats, plus intermediate and outside protective coatings for plywood surfaces. We understand that several concerns have suitable materials for this purpose and we invite them to write us and enclose descriptive literature relating to their product. Waterproof plywood is to be used extensively in the construction of airplanes, gliders, motor-truck bodies and watercraft, but these millions of square feet of exposed surfaces must have the right kind of protective coatings.

Another letter—one that refers more specifically to one kind of sealer and finish to use—follows:

"In reference to your request for information about the surface finish for plywood used in aircraft or boats, the usual procedure is as follows: A sealer consisting of a 30 gallon 100% phenolic varnish at low solids, in which China wood oil is used, is applied as a first coat. A resin, such as our Amberol ST-137-X, is widely used in such applications. A surfacer consisting of the same varnish at higher solids, pigmented with aluminum bronze, is then applied. A final coat of a lacquer type finish, formulated on the basis of U. S. Army Air Corps Specification 14105, camouflage lacquer, or Specification

14109, synthetic camouflage vehicle, is then applied.

This last specification has been formulated widely on the basis of our Amberlac 80-X, which is a fast-drying alkyd resin. These comments apply to plywood for aircraft use. In the case of plywood finishes for marine use, a similar varnish and surfacer are used. The top coat may be a spar varnsh or long-oil alkyd type, such as that formulated on the basis of our Duraplex D-63, which is widely used for marine type finishes. . . ." —The Resinous Products & Chemical Co.

French Polishing

We are interested in a Government contract in which hickory and Northern ash will be the woods used. In the specifications the finish called for is: "Natural finish, two coats of hand-rubbed French polish, not brushed." Will you kindly send us information as to the procedure involved in doing this work, and give us the names or sources of supply?—W. Furn. Co.

This refers to a very old method of finishing wherein shellac and oil are used, plus a great deal of hand rubbing. The material is applied by hand rubbing, distributed and leveled out by hand rubbing and polished by hand rubbing. You will probably find descriptions of the method in any old finishing books you may have or which you may be able to find at your local library.

Most manufacturers of wood furniture and other wood products con-

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sider French polishing to be too expensive in labor and too slow in production to be used economically today. However, when skillfully applied and well rubbed, this method does produce an attractive durable finish.

One of our experts suggests the preparation of material as follows: Take a quantity of 4-lb. cut shellac (gum shellac cut in the proportion of 4-lbs. to the gallon of alcohol) and thin it 50/50 with alcohol. To a small quantity of the thinned shellac, which you will use immediately, add oil (boiled linseed oil, mineral oil or medium thinned automobile oil) in the proportion of about three parts of thinned shellac to two parts of oil, or two parts of shellac to one part of oil. Shake this in a closed container. The shellac and oil will not mix exactly but will produce a sort of emulsion.

You apply this material with a cloth pad or pounce or bob. One authority suggests making the bob of knit wool rolled into a ball and covering same with a washed linen cloth which is free of lint. The ball is made up to about the size of a baseball. The inside is then wet with the shellac-oil emulsion so that by twisting the cover a certain quantity of the material may be squeezed through. Some experience is required to become thoroughly familiar with the exact technique used here.

Naturally, the wood surface should be perfectly smooth and clean before operations begin. Since your specifications call for a natural finish, you will begin directly on the bare wood in the white.

First you rub (to apply the coating) with a circular motion; then follow with long straight strokes with the grain of the wood. Of course, you must see to it that a reasonable quantity of material is coming from your pad and being distributed on the wood surface. It takes a lot of rubbing, working over a small area at a time.

As the work progresses, a few drops of alcohol may be added to the rubbing surface of the pad—if this seems necessary or desirable to keep the shellac coating in suitable condition for continued rubbing. Also, some oil may need to be added to the outside of the pad occasionally to prevent the shellac film from drying too quickly and forming ridges or a film of uneven thickness.

You work with the idea of putting on a coat of uniform thickness over the entire surface. Then follow by the same procedure with another coat. You do not build a quick film but your work will build a surface that is as smooth as glass. Details of the procedure, as just outlined may be varied, but in any event the results will be about the same.

Another of our experts, to whom we referred your problem, would have nothing to do with the French polishing method. His suggestion is one coat of lacquer sealer sprayed on; sand lightly with No. 4/0 sandpaper; spray one coat of clear lacquer. Rub with pumice and oil and, if necessary, follow with a light rubbing with rottenstone and oil.—ED.

Finishes for Maple Furniture

Mr. W. F. Dentzer: Your article in May issue of INDUSTRIAL FINISHING, "Conservation Improves Finish on Furniture," interests us and we will be pleased to learn details as to costs, etc., of the water stain and wash coat combination, varnish sealer and synthetic varnish you mention.

Yankee DOOLITTLE Dandy

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BRIGADIER GENERAL "JIMMIE" DOOLITTLE and his intrepid flyers delivered with daring and skill American calling cards to Admiral Tojo, Hirohito and his friends. The visit was well planned and executed and, as we all know, they flew from whence to thence and landed in Shangri-La.

Many months of planning and labor on the production front made this epic flight possible. Each one of us on the production front supplying war industries contributed to the success of this war effort. Our production facilities are devoted to the manufacture of government specification protective coatings in adequate quantity and without delay. Listed here are just a few of the war products now being coated with our materials.

Phone, wire or write and let one of our finishing experts help you "Keep Production Rolling."

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Presently we are manufacturing principally maple novelty pieces. However, in the near future, we also expect to use gum and cherry in maple, walnut and mahogany finishes.—S. Co. (Occasional Furniture).

Your interest in our method of finishing is appreciated. For finishing maple, I would make the following suggestions:

To each gallon of hot water add the usual amount of water-soluble stain powders for the desired shade. When the stain powder is dissolved, add 3-oz. of bi-carbonate-soda. This will saponify the water so that you will be able to stir in slowly one-half pint of 4-lb. cut white shellac.

This formula can be made up in any quantity. It will stay in perfect solution and be ready to spray hot or cold in the usual manner. I would recommend spraying this stain in a full even coat. Should sags appear they may be picked up with a brush.

Allow the stain coat three hours to dry. It will then be ready to sand as smooth and with the same result as you would obtain with the old method of using water stain followed with a washcoat of shellac. This method—meaning the combination stain and washcoat — will save you handling your furniture once, as well as saving the time required for each coat to dry separately.

You are now ready for a coat of varnish sealer, which requires four hours drying time at a temperature of approximately 100° F., or over night at room temperature, after which it is ready to sand. This

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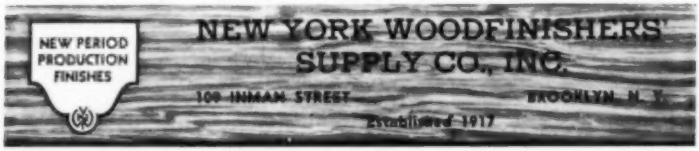
We find ourselves well prepared in our new and enlarged plant and laboratory to produce and deliver all kinds of protective coatings and finishes for materiel and for civilian industrial products. Listed here are some of the materials we manufacture.

Working samples and complete information will be sent on request.



sanding can be accomplished easily and quickly.

For the finish coat, I would recommend a waterproof synthetic finish. This varnish will dry, dust-free in 20 minutes, can be handled safely in two hours, with over night dry. It is ready to pack and this without printing. The synthetic is a semi-gloss of a sheen which is used extensively. We make this same varnish in any sheen from a dead flat up to a high gloss. In all different sheens this varnish flows absolutely free from orange peel. However, if you want to rub it, I suggest the use of pumice stone and oil for a dull rub finish, or it can be brought to a high polish by finishing with rottenstone and oil in the usual manner.

This varnish can be rubbed after an over night dry. The result will be a clean clear effect, absolutely free from any blue haze.

If for any reason your setup will not permit the time required for the varnish sealer to dry, I will then recommend in its place a lacquer sealer, which may be followed with a suitable top coat—and the same good results will be obtainable.—W. F. DENTZER.

Wood-Moisture Determination

The speedy and accurate determination of moisture content in wood, by the dependable electrical resistance method, is provided by the Model MB-L Megohm-Bridge with standard pin-type electrode, recently developed by Industrial Instruments, Inc., 156 Culver Ave., Jersey City, N. J. This simple, moderate-cost instrument supplies direct readings in moisture-content percentage terms for meeting various specifications covering precise condition of lumber, as called for by the Army, Navy, F.H.A., critical architects and builders, lumber mills and dealers, furniture manufacturers, railroads, public utilities and others.

Letters from I. F. Readers

(Continued from page 8)

"burn-in" knife. This calls for rather skillful work by a man who is well experienced in this kind of finish repairing. We suggest that you consult a furniture repair man in your city. He can do the work quickly, satisfactorily and at reasonably low cost.—ED.

Sprayed Plated Finish

In your March, 1942 issue of INDUSTRIAL FINISHING, you state that you have the name of a manufacturer who has a product that satisfactorily serves as a "sprayed plated finish". Kindly let us have the name and address of this firm.—E. K. Co. (Electro-Plating).

Information given.—ED.

Cleans Spray Booths

In the June issue of INDUSTRIAL FINISHING, there is an article, "Easier Cleaning of Spray Booths", on page 23. The article states that the name of the company making the spray booth compound described will be furnished on request. Can you give us this information?—K. G. Co.

Information sent.—ED.

Wood Filler

About a year ago I read an article in INDUSTRIAL FINISHING concerning fillers and their application, particularly regarding open-grain woods. As I recall, there was mentioned a commercial application alleged to minimize to some extent the hygroscopic action of some wood fibers. Could you refer me to this article or to the company selling the filler? I think it was sold as dry crystals or the like, but I may be mistaken on this.—R. E. D.

Finish for Toys

No doubt you are acquainted with the L-81 Limitation Order on toys and games, part No. 1156, which limits the use of certain finishes for toys. We understand that some manufacturers have developed a material that can be used as follows:

1) For spraying acetate toys, such as rattles and doll faces.

2) For spraying celluloid toys—rattles and faces.

3) Dipping and tumbling wood beads and similar items for the use of toys, which are not on the limitation order.

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Tells EVERYTHING you need to know about Wood Finishing. Includes types of unfinished furniture, choice of finishes, brushes, accessories, precautions, natural finishes, staining, filling and bleaching, varnish, enamel or paint finishes, finishing with a spray gun and many other fascinating practical subjects. Also includes complete section on furniture repairing and refinishing. Four pages of 32 different foreign and domestic woods illustrated in natural colors. 112 pages fully illustrated.

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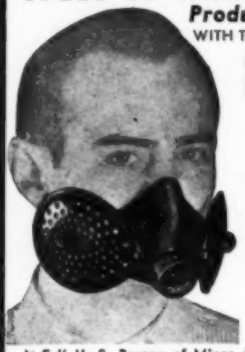

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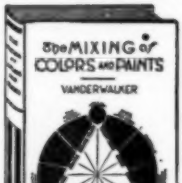

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Could you give us the names of these manufacturers? This is important to us and we would like you to rush the information at once—G. A. Co.

"Finishing Plywood Aircraft"

In your June issue there is an article by H. C. Lewis on "Finishing Plywood Aircraft". We are developing a special abrasive sandpaper for the sanding of the lacquers and resins mentioned by Mr. Lewis in his article, and we would like to obtain some of the material about which he has written so that we may experiment with it in our plant.—Industrial Abrasives, Inc.

Wire Stencil Screens Tumbling Barrels

In the June issue we note a reader's letter from the Prairie State Products Co., who states they are in position to furnish wire stencil screens. We would like to have their address so that we can get in touch with them.

We would also like to have you furnish us with the names of manufacturers of small tumbling barrels, suitable for tumble finishing of small wood parts.—H. Co. (Stringed Musical Instruments).

Molders of Wood Flour

On page 8 of the June issue we note an inquiry with regard to "Wood Flour Composition". We are molders of a composition which this inquirer may have in mind. Possibly if you would give us the name and address of this query we could get in touch with them and ascertain their requirements.—W. & Sons.

Filling Etched Brass Plates

We notice on pages 68 and 70 of your June issue, the inquiry regarding filling of etched brass plates. We believe that their job is very similar to one which we are doing every day for any number of manufacturers.

If this concern is anywhere near our vicinity (Milwaukee, Wisc.) we would appreciate the opportunity of finishing samples and bidding on the entire job. However, if this is not possible and they will communicate further information to us, we will be glad to cooperate with them in solving their problems.—Spray-Rite Enameling Co.

With the use of aluminum in the finishing industry highly restricted by the recent M-1-G aluminum order, Maas and Waldstein announces the development of V-Metalustre —a Victory finish.

V-Metalustre contains a non-metallic material in place of the aluminum used in Metalustre. Its finish is very similar to that of Metalustre and former Metalustre users have found it very satisfactory.

V-Metalustre, available in 10 colors, is for one coat application, except in the lighter tones, when two coats are desirable. It should be used for air drying applications only.

Send for bulletin giving complete specifications of V-Metalustre.

This announcement is consistent with the Maas and Waldstein policy of constant research to develop new finishes in keeping with the war economy.

ARMAMENT MANUFACTURERS

Send for our new booklet of U. S. Government Specification Finishes used in armament production. Our Engineering Staff is at your service for help on any special finishing problems.

M&W

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Safety Equipment Booklet

An 8-page booklet published by Mine Safety Appliances Co., Pittsburgh, Penna., contains descriptions and illustrations of a large line of safety equipment which is useful in industrial establishments. Copies can be obtained by writing the company.

Resin-Bonded Plywood

Information and many illustrations relating to the above subject are found in a folder published by Durez Plastics & Chemicals, Inc., North Tonawanda, N. Y. This plywood is shown in service as sides for station wagons and closed trucks as well as for boats and aircraft.

Helping Industry Help America

The above title is on a 16-page illustrated booklet recently prepared for distribution by the Sun Oil Co., 1608 Walnut St., Philadelphia, Penna. It is attractively printed in black, blue and yellow on white paper.

Infra-Red Drying Bulletin

Many interesting illustrations of infra-red drying installations in industrial establishments, plus a few that feature fluorescent lighting in industry, are included in an 8-page booklet (10x13½-in. pages) being distributed by The Fostoria Pressed Steel Corp., Fostoria, Ohio. Another illustrated booklet of the same size features fluorescent lighting exclusively.

Liquid Equipment Book

Equipment of the latest type for the handling, storing, measuring, metering, filtering, straining and pumping of liquids, is illustrated and described in a new 40-page book just published by S. F. Bowser & Co., Inc., Fort Wayne, Ind. Much of this equipment is useful in finishing and paint rooms. The page size of the book is 5x8-in.; the cover is a heavy paper in two tones of blue and printed in orange.

News Fronts of the World

In commemoration of June 13, MacArthur Day, The Lawrence-McFadden Co., Philadelphia, Penna., has distributed a magnificent lithographed picture of General Douglas MacArthur by Charles Ernest, which also contains a brief biographical sketch of the General.

Below the picture of MacArthur are six individual maps under the title of "News Fronts of the World," namely, The World, The Philippines, Europe, Asia, The Malayan Peninsula, and Hawaii. It measures about 2½x3½-ft. and is an inspiring and patriotic reproduction for plants doing war work.

New Books

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NEWS RELEASES

Abrasive; Masking Tape

How abrasive paper and masking tape are being used so effectively in many war industries is illustrated and described in a 24-page booklet recently published by Minnesota Mining & Mfg. Co., St. Paul, Minn. Page size is 8½x11-in. Many suggestions and a great deal of practical information are contained in this valuable book. Send for a copy.

Jetal Finish Booklet Free

A new 12-page booklet of 8½x11-in. size, bound between heavy paper covers, contains information about the Jetal process for producing a black oxide coating on ferrous metals. Other metal finishes such as "white brass" and gold solutions are listed. Copies are obtainable by writing Alrose Chemical Co., Providence, R. I.

Lighting Specifications for War Production

A new lighting manual to meet the need for up-to-minute data on the use of lighting as a production tool in solving the problems of production, rejects, employe fatigue, accidents and morale, greater utilization of floor area, windowless plants, 24-hour operation, etc., is announced by the Benjamin Electric Mfg. Co., Des Plaines, Ill.

Title of this new war-time lighting guide is "Benjamin Specifications for Productive Lighting in War Plants."

It is designed to provide executives, plant men, architects—all those concerned with lighting in war plants—with the latest information on the best methods of using lighting economically and efficiently as part of the Production Drive.

A complimentary copy of Benjamin Specifications for Productive Lighting may be had without cost or obligation by simply addressing the Benjamin Electric Mfg. Co., Des Plaines, Ill.

Floor Finishing Booklet

"How to Finish 16 Kinds of Floors" is the title of the new floor finishing booklet just published by the O'Brien Varnish Co., South Bend, Ind. This handy reference booklet was designed to fill the need of the floor finisher, painter and maintenance man for a catalog containing complete floor finishing specifications. Inside its covers are found specifications for finishing floors and floor surfaces encountered in building and building maintenance. With a thorough knowledge of the various systems listed it is relatively simple for the finisher to choose the one which suits his particular job, his operating methods and the client.

Blackout Paints and Adhesives

A 4-page illustrated descriptive circular lists several removable blackout paints and adhesives for use in blacking out windows and skylights; also luminous paint that glows in darkness. According to the manufacturer, these materials have been "perfected and tested to meet your practical needs." A copy of the bulletin can be obtained by writing Lasting Products Corp., Franklintown Road Plant, Baltimore, Md.

Aircraft Finishing Bulletins

Two new bulletins, one entitled, "Airplane Plywood Finishing," and the other, "Airplane Fabrics Finishing," have been prepared and are available on request from Randolph Finishing Products Co., Carlstadt, N. J.

Helping Industry Help America

Here is a booklet that reveals actual case histories of how engineering service is applying petroleum products in metal working, and other operations, helping American industry produce more. In view of present-day industrial requirements this booklet should be recommended reading for every industrial executive, plant production man and shop superintendent. Copies are available upon request. Write Sun Oil Co., 1608 Walnut St., Philadelphia, Penna.

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1142 N. Meridian St. Indianapolis, Ind.

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Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metalworking, woodworking and miscellaneous industrial plants where production finishing is a major operation in parts and products manufacture.

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Published the 18th of each month by PRACTICAL PUBLICATIONS, Inc. 1142 N. Meridian St., Indianapolis, Ind. Telephone.....Riley 6771

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President and Editor.....W. H. Rohr
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Subscription Rates Per Year
U. S. and Possessions.....$2.00
Canada and Foreign Countries.....$3.00
(No subscription solicitors are employed)

Editorial

Reclaim Your Used Solvents

Millions of gallons of valuable chemical solvents and oils which are now being discarded, can be reclaimed for further production purposes, it was declared recently by S. Donald Perlman, salvage director for the chemical and textile industries of the Industrial Salvage Section of the Bureau of Industrial Conservation.

"Contacts and conferences with business firms engaged in the reclamation and recovery of commercial solvents," said Mr. Perlman, "indicate that they have facilities available for increasing by 50% to 75% the amount of solvent reclamation now going on in the country. Salvage of dirty contaminated solvents, so that they can be used again in industrial processes and channelled into war production is a problem to which every commercial user of solvents and oils should pay attention. We cannot afford to waste precious chemical resources."

The same chemicals that are used for solvents are also employed directly or indirectly in the manufacture of munitions and other war material, Mr. Perlman pointed out. The principal types of solvents that can be reclaimed are alcohols, chlorinated compounds, esters, ethers, hydrocarbons and ketones. This list includes such items as benzol, needed to make synthetic rubber, and toluol which goes into TNT. Solvents are used in a great number of steps in the manufacture of all kinds of war and civilian goods.

An educational campaign has been initiated by the Bureau of Industrial Conservation to make sure that all users of solvents take advantage of the facilities available for reclaiming and recovering them.

Recovery of solvents means condensing vaporized solvents as part of the original manufacturing process. About 1,000,000,000-lbs. a year are now being saved in this way. Reclamation of solvents often means hauling away the sludge and contaminated contents of vats and putting it through a special reclaiming process. A number of concerns, of course, have their own equipment for reclaiming solvents.

Copyright 1942—Industrial Finishing Magazine.

A larger size reproduction of this cartoon will be sent free to those who request it on their business stationery. Only a limited number of copies are available.

Clean chemicals may be obtained by such operations as distilling, centrifuging, filtering, washing, or decanting.

There is an economy side to the picture of reclaiming solvents as well as the presently vital factor of conserving them for war production. A solvent that cost 20c or more a gallon, for example, may often be reclaimed for as little as 2c a gallon and used again.

Salvage Scrap for War

The nation's scrap is a virtual "mine above ground" of materials needed for implements of war, and as 75% of the total scrap available in this country for this purpose will come from industrial plants, according to surveys made by the War Production Board, it is up to industry to work this mine.

Such campaigns among industries throughout the entire country have already been set up in large industrial cities. In discussing the type of scrap that industry must apply to the country's war production needs, an official of the Industrial Salvage Committee said: "Approximately 90,000,000 tons of steel will be needed by the nation this year, of which 32,000,000 tons must come from iron and steel scrap; and 5,000,000 tons of copper will be needed, of which 1,500,000 tons must come from copper scrap. Rubber," he continued, "presents the most serious problem, in that we must have 800,000 tons this year, and practically all of it must come from scrap rubber and existing stocks on hand. In addition, scrap must do its share to make up for the loss of tin from Malaya and the Dutch East Indies, which formerly produced 75% of the world's supply. South America has never produced more than 40,000 long tons of tin, and that of poor grade."

The War Production Board has classified scrap and waste in seven basic groups; iron and steel scrap; non-ferrous metals (brass, copper, aluminum, lead and zinc); waste paper, scrap rubber; cotton and woolen rags; Manila rope, burlap and commercial solvents; miscellaneous products.

The campaign calls for the appointment, in every plant, of a salvage manager who will be responsible for salvaging all scrap and other materials not needed at this time in actual manufacturing, and the scrapping of obsolete machinery and equipment. This manager will be charged with seeing that such scrap materials are sold to junk dealers who will dispose of them promptly and get them back into the bloodstream of industry. Industrial chairmen are being appointed for every type of industry to whom the plant salvage managers will be responsible.

Ideas to Help Win the War

In response to Donald Nelson's request for every manufacturing establishment "to provide machinery whereby each man may submit ideas and suggestions for doing the job better . . ." many concerns have encouraged and received valuable suggestions from their employes.

One concern that had remarkable success along this line is Bausch & Lomb Optical Co., Rochester, N. Y. The company had a suggestion system already in operation but this was completely redesigned. Although the regular suggestion system had always paid liberally for acceptable ideas, the company

agreed to pay double awards during a special campaign which started on March 20 and continued through May 9. This included the MacArthur month.

Numerous ways were used to call the attention of employes to the campaign and get them to thinking up "ideas that will speed the flow of vitally needed war products; ideas that will conserve time, material and labor; and ideas that will inspire employes to think, work and save."

The response was spectacular. Suggestions increased 500%. More than 2,000 suggestions were submitted and the awards for same amounted to more than $12,000.

The company was so encouraged by this remarkable response that it has published a 16-page illustrated booklet to explain how the campaign was carried on. The company declares that less tangible, but no less important, is the effect of this campaign upon employe morale. They are confident that they have successfully focused the attention of everyone in their organization not only upon the important part this company is playing in providing the weapons of war, but also upon the vital issues of the conflict.

Too Busy to Read?

We heard of a war factory production man recently who declared that he had quit looking over his industrial publications because he was too busy to read anything. We disagree with this man's decision, regardless of how busy he is or how important he is.

New developments, new requirements—in fact new everything—are appearing rapidly and many of these things are vitally essential to every production executive. Where is he going to learn about them? Today he has fewer visitors who are familiar with those things. He hasn't much if any time to travel and visit others to find out—and besides travel is discouraged.

Take away a man's industrial publications now, and the set-up for his getting into a rut and staying there is probably more favorable than at any time in the past. Some of the busiest and best informed men in various industries

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are actually writing articles that appear in these magazines — and what they have to say isn't worthless.

It takes only a few minutes to leaf through an industrial publication. When a certain advertisement or article catches your eye you can either read it then or make a note of it for early attention—or send it to a subordinate to read. Don't be guilty of missing important information or essential developments, with no better excuse than that you "haven't time to look through your industrial magazines."

Well-informed men take time to keep abreast of what is going on in their own industry — and we need well-informed men today on the production front to help win this machine-age war, which we are all in up to our necks.

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Army Turns to Wood for Cargo Truck Bodies

The army has definitely decided to change from steel to wood bodies for all cargo trucks, and intends to have a production schedule of 1,000 bodies or more per day in progress by July 1.

About 12 prime contractors (truck manufacturers) were required to submit sub-contracts for wood bodies to the Office of the Quartermaster General by July 6.

This means that tremendous quantities of wood preservative materials and wood protective coatings will be in immediate demand —plus suitable equipment for applying and drying same.

According to the latest specifications, the wood must be treated thoroughly against decay, with preservatives conforming to QM specifications HQD ES-680, class 38, Type One. After treatment and before painting, the wood shall be primed with a long-oil primer-sealer. The wood must withstand continuous exposure to weather under varying climatic conditions.

For general use in the manufacture of these bodies, sills and bolsters may be made from oak, ash, hard maple, beech, yellow birch, hickory, rock elm, pecan, and locust.

For panels, western pine, white pine, longleaf yellow pine, oak, white ash, sugar maple, pecan, hickory, yellow birch, beach Douglas fir, poplar, ponderosa pine, cypress, cottonwood, sugar pine, Idaho or northern white pine, western hemlock, and redwood.

Using Synthetics

IN REFERENCE to synthetics, their reduction and storage, I would suggest that companies using only 15 to 20 gallons of material

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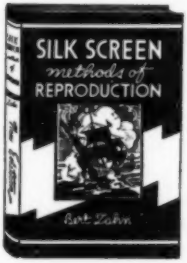

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per day, always buy their material in 5-gallon cans. These smaller containers can be easily reversed twice weekly while in storage to help keep the pigments in suspension and thereby save much work and worry later. Of course, synthetic enamels do not have as much tendency to "settle out" as do oil enamels. They do not require as much "boxing" or mixing as oil colors.

Synthetics should never be reduced entirely with reducer. It is better to use some heat to help thin them. For example, materials that call for 1½ parts of reducer to four parts of material will work good, but the coating will look thin. Use one part reducer to four parts of material and then heat the material to say 90° F., doing it carefully and safely in a water-jacketed container. This thinning of the material partly by heat will result in improved "flow" and greater coverage, leaving less of that orange peel effect.

These materials should be sprayed with a material-tank pressure ranging from 8 to 13-lbs.—never more nor less, preferably 13-lbs. Of course, this depends on the sprayer, whether he is fast or slow in his work. Pressure on the main air line gauge should be adjusted to maintain a working pressure of 65-lbs. while the gun is in operation.

When using a modern type of gun made by any one of what I call the "Big 3," I use a fan spray no wider than 4½-in., holding the nozzle of the gun 8 to 12-in. from the work. I believe that a wider fan spray is just a waste of material.

All finishing material should be placed in the finishing room 24 hours before being used, so it will have plenty of time to become equalized or adjusted to the room temperature.—E. C. LEROY.

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As a result of the many demands for industrial finishes and other protective coatings made upon the individual divisions of General Printing Ink Corp. by the war program, it has been decided to pool the facilities of the entire corporation into one division—GENERAL INDUSTRIAL FINISHES.

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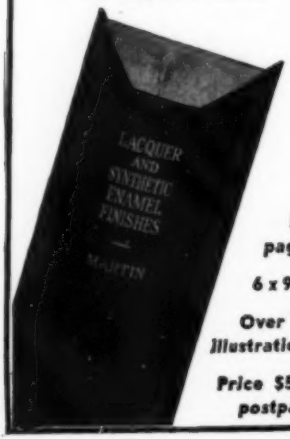

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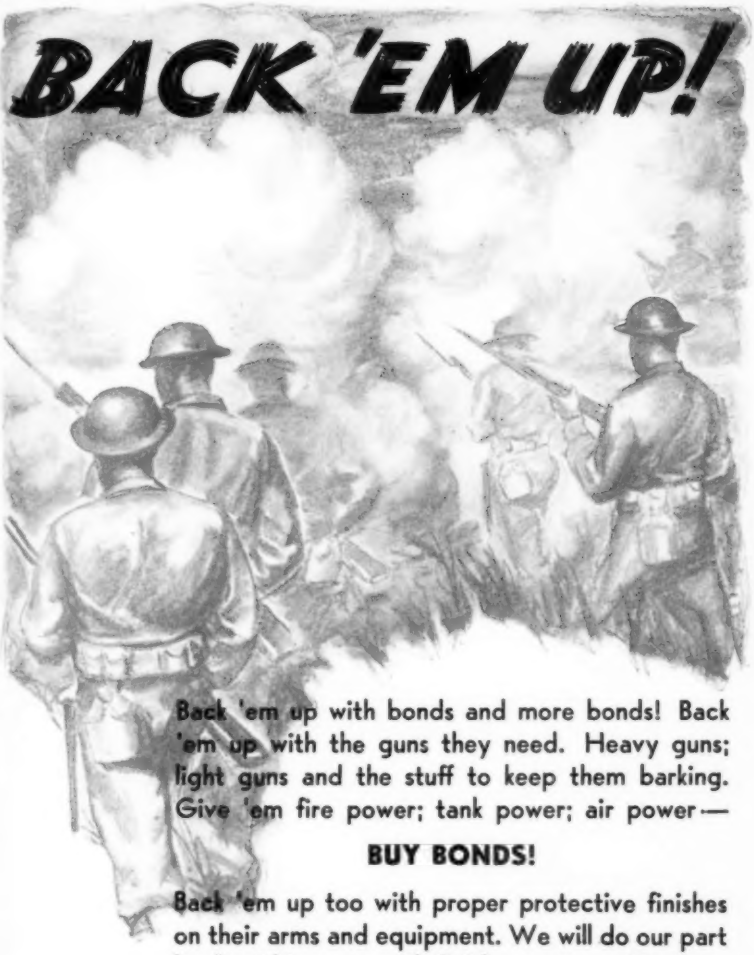

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